HC
285
.H47

LIBRARY OF PRINCETON
JAN 19 1996
THEOLOGICAL SEMINARY

HC
285
.H47

HC
285
.H47

LIBRARY OF PRINCETON
NOV 17 1914
THEOLOGICAL SEMINARY

GERMANY'S ECONOMIC PROGRESS AND NATIONAL WEALTH 1888—1913

BY

DR. KARL HELFFERICH
DIRECTOR OF THE DEUTSCHE BANK

NEW YORK
Germanistic Society of America
1914

All rights reserved, including the right to translate.
Copyright 1913 by Georg Stilke, Berlin.

FOREWORD

The account here presented of the development that has taken place in the economic conditions of Germany in the last twenty-five years was originally published, under the title of "Deutschlands Volkswohlstand 1888–1913," as the complementary part of a larger work issued at the time of the celebration held by Germans throughout the world to commemorate the peaceful and prosperous reign of the present German Emperor.

It is thought that an English translation of the book may not only serve to bring vividly to the attention of those in the United States who are interested in the intelligent consideration and evaluation of our own economic conditions the actual situation at hand in another industrial nation, but that it might point out, in some instances at least, by possible comparison, the true directions of economic progress that should be pursued here as there for the welfare of the nation.

The Germanistic Society of America, in furtherance of its purpose to promote in this country a wider and more accurate knowledge of the German people, has gladly taken the opportunity of making accessible to American readers in an English version this most careful and conclusive statement of Germany's economic prosperity.

Germanistic Society of America.

Deutsches Haus,
New York, January, 1914.

Contents.

Page

Introduction 3

Chapter I.

Population, Technique, and Organisation.

A. Population. Population and food supply. Germany's increase of population. Birth-excess. Decline of emigration and increase of immigration. Growing intensity of German labour. Shifting of the working population to industry and trade 13

B. Technique. Natural science as the basis of modern technique. Perfection of the steam-engine and increase of steam-power in Germany. Electricity and weak and strong-current technique. Power transmission and its influence in the utilisation of sources of power. The gas-engine. Combustion motors. Development of the machinery industry up to the automobile and the airship. Chemistry and technique. Agricultural chemistry. Improvements in iron and steel production. The scientific investigation of coal and its products. Chemical industry. Summary 21

C. Economic Organisation. Nature of economic organisation: division of labour and association of labour, education and training of labour, association of capital

Page

and labour. Development of the division of labour in its relations to home and foreign markets. Developments in the association of labour as regards size of factories and combinations of factories. Mobilisation and concentration of capital through the development of the company form of organisation and the development of credit. Syndicates, community-of-interest arrangements, etc. The perfecting of economic organisation and new problems in the development of our people 34

Chapter II.

Production, Traffic, Consumption.

A. Production. Production statistics. Development of agricultural production: food crops, sugar beets, livestock. Development of industrial production: Coal, iron and steel, and other industries, with number of employés, steam-power, and exports 50

B. Traffic. Increase in number of persons employed. Postal and telegraph business. Development of money and credit operations. Development of internal transportation: railways and internal waterways. Development of foreign commerce and the shipping trade. Protection and encouragement of our foreign trade relations: commercial policy, colonial policy, German undertakings abroad, the navy 67

C. Consumption. Development in the consumption of important food crops. Meat consumption. Consumption of alcoholic beverages, tobacco, salt, sugar, exotic groceries, and cotton. 85

Chapter III.

Aggregate Income and National Wealth.

A. Aggregate income of the German people. Results of the Prussian income-tax assessments. Supplemen-

Page

tary estimates. Average per caput income 600 marks, aggregate income 40 000 000 000 marks. Comparison with French and English estimates. Distribution of the incomes of the people among the different income-groups, and the development of this distribution: large decrease of persons with less than 900 marks income, large increase of incomes between 900 and 3000 marks and between 3000 and 6500 marks. No plutocratic development but elevation of the broad masses. Wages in England and Germany 94

B. The National Wealth of Germany. Results of the Prussian property-tax assessment. Necessary additions. Results of fire-insurance, and supplementary estimates. Total national wealth at least 300 000 000 000 marks, against 200 000 000 000 marks in the year 1895. Comparison with French, English and American estimates 105

C. Yearly Increase of National Wealth. Yearly consumption of the Empire, the Federated States, and other political organisations. Visible increase of national wealth as seen in issues of securities, deposits of banks, savings-banks etc. Calculation of the total annual addition to the national wealth according to the property-tax assessment and the increase of values insured against fire. Average annual increase for the past fifteen years 6 000 000 000 to 7 000 000 000 marks, during the past three years about 10000000000 marks 115

GERMANY'S ECONOMIC PROGRESS AND NATIONAL WEALTH 1888—1913

Introduction.

On the dial-plate of the world's clock, the time-piece of the nations, twenty-five years make but a short period. The history of nations is measured in hudreds and thousands of years. The significance of succeeding epochs, however, is not measured by their extension in time, but is weighed rather by their development-force; and this is unequally distributed. In the life of nations, as in the life of the individual, times of growth and times of rest alternate. It lies deeply rooted in the psychology and the physiology of man and communities of men that their most active creative work, their highest achievement, is compressed into short periods, whereas their periods of quiet and slow preparatory work fill out the broad stream of time. Happy are the generations that lift themselves to higher potentialities of existence, and doubly happy the chosen few to whom it is given, in such halcyon periods, to stand at the front and be the leaders of humanity!

The twenty-five years of the reign of our Emperor now closing will be ranked by history among the great periods in the development of our people. Letting our vision range back into the past to the dawn of the

German race, we find many a an age of heroic greatness and splendid expansion in power, many an epoch of brilliantly flowering intellect and high artistic culture; but we find only one period in which the total conditions of life were broadened in such a manner — albeit on a much more modest scale — as in the age in which we live, — namely, the flowering-time of the Renaissance and the Reformation. At that time there ripened, like today, in material and intellectual culture the fruits of the labour and struggles of centuries; at that time, like today, the spirit of an impetuous forward impulse seemed to burst the fetters that had long weighted it down, to thrill the heart of the whole people, and to lead them irresistibly to higher levels of life.

Wherever there is light there are also shadows. He that stops to look at the shadows may stand apart, doubting and condemning. But if anyone wants to form a just judgment of our age in the totality of its phenomena, let him bring them into their larger connections with our history, above all let him look back upon the depression that separates our age from the heights of the fifteenth and sixteenth centuries. We see, beginning about the middle of the sixteenth century, a grievous decline; international quarrels among Emperor, princes, nobility, and the municipalities, intensified by the strife between the two religious creeds, consume the power of the Empire. Mighty events of universal significance — the finding of a sea-route to India and the discovery of America — divert the pathways of the world's trade from Germany and give to other countries the mighty advantages derived from the new worlds. Germany loses the political and economic power to defend itself from neighbouring nations and becomes the battle-ground of

foreign armies. After the profound calamity of the Thirty Years War, which depopulates and impoverishes Germany and deeply depresses its intellectual and moral culture, there follows a gradual, oft-interrupted recovery. Under the Great Elector, and still more under Frederick the Great, there is formed in the north the sound nucleus of future political readjustment. At the same time there springs up out of the ruins and waste of unspeakable desolation a wonderful new flowerage of poetry, art, and science, — a new culture which becomes the intellectual bond of the reawakening German race. As iron passes through fire to become steel, so Germany, for its rejuvenescence, passes through the Napoleonic wars. The dreadful trial results in a rebirth. Out of this life-and-death struggle is born the knowledge of the military, political, and economic necessities of a new era. The organisation of a popular army renders it possible to shake off the foreign yoke and lays the foundations for later military successes. The liberation of the peasantry and the unfettering of trade, municipal self-government and the constitution break the social, economic, and political bondage, and open up to the growing capacities of the German people a wide field for free activity. The Zollverein removes the toll-bars within Germany and creates a homogeneous German economic territory. The feeling of belonging together — intellectually, economically, and politically — fuses into one people the various German racial stocks. The struggle of the centuries reaches its goal when the German Empire is born out of the fellowship of blood, renewed in the glorious war of the people.

But this crowning result of development does not denote a termination; it is but a new beginning. The

powers that were formerly wasted in war and strife among our own people, that reached their full development later in the struggle for national liberty and unity, had been set free, after the restoration of the Empire and the re-establishment of Germany's political power, for a work of civilisation laying hold of and penetrating into the whole life of the people. The imposing bulwark of our army, to which our Emperor has added a mighty navy, has ensured for us more than forty years of peace and has given protection and encouragement to the German not only at home, but wherever he might settle in any part of the world. Thus enjoying the protection of peace and working with unresting, unflagging energy of head and hand, the German people have made up for the centuries lost in impotence and self-destruction; they have broadened all the conditions of their life from a contracted narrowness to an undreamt-of expansion; and, all things considered, they have achieved an advancement, such as, compressed within so brief a time, the history of nations can hardly parallel. During the first quarter of a century after the founding of the Empire, which was naturally followed by a reaction from the enormous strain upon all our energies, this development went forward hesitatingly and with interruptions; it was still a period of concentration and proparatory work. The impetuous and triumphant upward movement that began in the first half of the nineties, falls, in its full extent, within the reign of our Emperor. A period of development almost wholly detached from economic, social, and political conditions, yet a period of great political evolution, has been followed by a period of economic achievement and social progress.

Some persons have reproached our age with the

emphasis it lays upon economic development and have brought our material progress into contrast with the development of intellectual, esthetic, and ethical culture, and with the times of great political achievement. They are in the wrong. Economic and social development cannot be understood as isolated phenomena, but only in relation to the whole development of the people; and in this it is certainly a co-ordinate factor. All the various expressions of the life of a great people influence and permeate each other reciprocally and tend toward the ideal of a happy equilibrium. The adage, mens sana in corpore sano, holds good not for the individual man alone; it is a truth of equal value for the nations. The sound body in this case is the sound, vigorously growing economic and social structure of the people in their totality.

In economic development Germany had more to make up than other countries. The Germany people, from their earliest appearance in history, were inferior to no other race in moral health and power. For centuries Germany had participated most prominently in the development of the natural and intellectual sciences; in the world's literature and in the fine arts it had won a place in the front rank, so that the Germans were known among the other nations as the "people of the thinkers and poets". In a military and political sense, too, Germany had won anew its rank among the nations. On the other hand, the task of lifting the material conditions in the life of the German people to the level of their intellectual and political achievements was reserved for their economic and social work.

"How everything is woven into a whole, how one thing works and lives in another", is revealed with

wonderful clearness in the development whose result is the Germany of today. The political regeneration of Germany and the re-establishment of our military power, which has guaranteed us liberty and freedom, laid the foundations for the unfolding of our economic power. And, conversely, the increase of our economic power supports and strengthens our political and military position. Our economic development has enabled us, and will continue to enable us, to raise the huge sums needed to bring our defensive forces on land and water to such a point in numbers and equipment as will permit us to confront any enemy without fear. The mental training and the scientific progress of the centuries have created the equipment to which our economic labour owes its successes of the past few decades; and, conversely again, it is the result of our economic labour, namely, the increase in the wealth of the people, that makes it possible for the great masses to participate in the achievements and advantages of intellectual and artistic culture. Where the broad masses of a people expend their whole life-energy in a hard struggle for daily broad, the finest fruitage of art and science is confined to a narrow circle of the chosen few. Only where economic labour yields an abundant result for the broad masses, where the struggle for mere existence does not call for the entire strength of the classes working at manual labour, can culture become a common possession of all. And to make it a common possession is the ultimate and highest purpose of all cultural progress.

It is only in such a connection as the above that the full value of economic development can be understood. It is assuredly no small thing when the perfec-

tion of technical equipment and the improvement of organisation of economic labour lift millions out of material misery to a manner of life satisfactory to themselves and worthy of human beings. But it is infinitely more when the productivity of economic labour thus enhanced opens to millions and millions the doors to the highest values of life.

In this sense is to be understood the following representation of the development of wealth in Germany during the first twenty-five years of the reign of our Emperor.

Elements of Treatment.

The power that creates and increases the wealth of a people is labour, — from the purely manual labour of the wage-earner to the purely intellectual labour of the scholar.

The vehicle of labour is man, or — as regards the whole state — the population.

The result of labour is the production of goods.

The productivity of labour is intensified by perfecting technical equipment and organisation.

For the people as a whole the increased efficiency of labour finds expression in the statistics of production, trade, and transportation.

The final purpose of economic labour is consumption.

The surplus of goods produced over and above the necessary expense of production constitutes the income of the people.

The surplus of the income of the people over their consumption constitutes the increment of the public well-being.

Those are the elements with which our essay has to deal.

The ideal economic development is that a growing population be able to increase the net efficiency of its labour, and thereby its "income", to such a degree that, at the same time, a higher standard of life — in other words, a more plentiful satisfaction of material and intellectual wants — and an enhancement of the public wealth be attained.

CHAPTER I.

Population, Technique and Organisation.

A. The Population.

The movement of the population of a country is the fundamental element of all economic, social, political, and cultural development. An increase in the number of the people denotes an increase of labour-power and political power, denotes a broadening of social and cultural problems. Conversely, the increase of population presupposes that the augmented productivity of economic labour creates the material possibilities of existence for the greater population.

According to a well-known theory of social economy population has a natural tendency to increase more rapidly than the food supply can be enlarged; and the distress of the great masses follows inevitably from this as by a natural law. We know today that this ostensible natural law is not unconditionally valid, that the food supply of a country is no invariable factor, nor one that changes only according to fixed rules; but that it can be enlarged in such a measure through increased intensity of labour, through improvement of technical equipment and methods of work, through perfection of the system of labour, through expansion of the national and the international exchange of commo-

dities, as not only to keep pace with the natural growth of population, but even to exceed it. In this possibility, and only in it, lies the hope for permanent progress in the development of the nations; and this hope — it may be already asserted — has been realised in the age to which we belong, and in the country which we call our Fatherland.

In the territory now composing the German Empire there lived in the year 1816 only about 25 000 000 people. In the year 1871, when the Empire was founded, the population had risen to 41 000 000. In the year 1888, when our Emperor took over the government, the population of the Empire was 48 000 000. During the twenty-five years that have elapsed since then the population has further increased by more than one-third to 66 000 000.

The yearly excess of births has long amounted to about 800 000 souls. It is larger in proportion to the population than in all the other great European countries, except Russia — even larger than in the United States of America. In the year 1911 the excess of births over deaths to every 1000 inhabitants was as follows:

Germany	11,3
Russia	17,0*)
Austria	9,5
Hungary	9,9
England and Wales	9,8
Italy	10,1
France	—0,9
United States	5,4 to 9,9 (where vital statistics are kept).

*) for 1906.

The fact must not be ignored here that the net excess of births in Germany has shown in recent years a reduction that has attracted much attention. In the decade 1881-1890 the excess for every 1000 inhabitants was 11.7, in the following decade 13.9, and in the decade 1901-1910 the average was further raised to 14.3. The maximum was reached in the year 1902 with 15.6; whereas the year 1911, as already mentioned, had an excess of only 11.3. It is not possible here to go into the causes of this movement. It may be admitted that the decline gives occasion for serious reflection on many conditions and evils of our time.

In order to form a judgment of our whole economic and social development, it is of special interest to compare, in the following table, the two rows of figures giving the death and birth rates and the resulting excess:

Yearly average for the decades	Absolute numbers			per 1000 inhabitants		
	Born	died	excess of births	born	died	excess of births
1871-1880	1 743 888	1 232 854	511034	40.7	28.8	11.9
1881-1890	1 798 778	1 247 470	551308	38.2	26.5	11.7
1891-1900	1 964 108	1 233 843	730265	37.3	23 5	13.9
1901-1910	2 061 482	1 195 144	866338	33.9	19.7	14.3
1911	1 927 039	1 187 094	739945	29.5	18.2	11.3

This comparison shows that the absolute increase in the excess of births over deaths, observed up to a few years ago, was not due exclusively to the increase of births, but also to the decrease of deaths, — a fact doubly surprising in a population so greatly en-

larged. The relative figures, showing deaths and births per 1000 inhabitants, are much more striking: from 1871-80 to 1901-10 the number of births dropped from 40.7 to 33.9, that of deaths on the other hand from 28.8 to 19.7, with the result that the relative birth-excess increased from 11.9 to 14.3. There was, accordingly, an increasing birth-excess, accompanied by a decline in the number of births, in consequence of diminished mortality.

Many conclusions may be drawn from these facts, but only the following will suffice here:

Undoubtedly economic considerations exercise an influence in the reduction of the proportional birth-rate, probably even a larger influence than — from the standpoint of the preservation of the race — is to be desired. Unquestionably, however, the heavy reduction in the relative numbers of deaths is a favourable phenomenon. The reduction of this number from 28.8 in the decade 1871-80 to 19.7 in the last decade means a corresponding lengthening of the average duration of life; and this lengthening in so marked a degree was only possible in consequence of a thoroughgoing improvement in the whole standard of life of the great masses of the population. Of special importance is the reduction of infant mortality. In 1901 the number of children that died in the first year of life was 20.7 to every 100 born alive, but in 1910 only 16.2. The year 1911, indeed, saw an increase again to 19.2, but this increase finds its explanation in the unusual summer heat, which always causes an increase in infant mortality.

The considerable reduction of mortality in general must be the joint result of better feeding, less wasting

of strength through excessive work, and more favourable sanitary conditions. The reduction in the relative number of deaths proves therefore that Germany's population, which is today one-third greater than it was twenty-five years ago, is far stronger than it was only a few decades ago.

The great addition to the population during the past twenty-five years has found employment more and more within Germany itself. Emigration, which in the eighties of the last century still reached enormous porportions, has dropped almost to insignificance. This development cannot be measured in its full extent till we compare the number of emigrants with the excess of births. In the decade 1881-90 there were 1 342 000 German emigrants, as against a total birth-excess of 5 500 000; in the following decade there were still 528 000 emigrants to 7 300 000 net births; but in the decade 1901-10, when the birth-excess rose to 8 670 000, the number of emigrants sank to 220 000. In the year 1912 the number of German emigrants was only 18 500. If, while considering emigration from Germany, we also take into account immigration into Germany, a still brighter colour is given to the picture. Whereas Germany always had formerly a more or less considerable excess of emigration over immigration, there has been an excess of immigration since the middle of the nineties. After having been an emigrant land, Germany is becoming an immigrant land.

All this proves that economic opportunities have grown more rapidly in Germany during recent decades than the population. The demand for labour, the opportunity for remunerative employment has expanded even faster than that the population has grown.

At the same time the population is labouring with greater intensity. The labour-product of the individual, indeed, can hardly be measured. We have to trust here in the main to general observation, which confirms the view that the amount of work accomplished by the individual has been increased, — and that notwithstanding the wholly justifiable restriction of the hours of labour, particularly in manufacturing callings, which was undertaken out of social considerations. A comparison of Germany with other countries also shows Germany to be the land of labour. At one point, however, statistical data are at hand, — namely, figures showing the number of the working population and their proportion to the total population. The censuses of occupations for 1882, 1895, and 1907 showed the following results: —

Persons employed in Agriculture, Industry, Trade, and Transportation.

1882:	16 203 300	persons,	or	35.4%	of	whole	population
1895:	18 912 400	„	„	36.4%	„	„	„
1907:	24 617 200	„	„	39.7%	„	„	„

The enormous increase in Germany's population, particularly its productive part, could not occur without marked displacements in the distribution of the population among the various callings.

In a country of long cultivation like Germany the area available for agriculture and forests is not capable of any considerable increase. Of course, new land of considerable extent can be gained in Germany, if the efforts to recover the widely-extended moors in many parts of the Empire prove successful. His Majesty, the Emperor, has devoted special attention to this important question, and he gave evidence of his interest in an

address delivered before the "German Agricultural Council" on February 17, 1911.

The greater intensity in the cultivation of the soil has a tendency, of course, to create an increased demand for labour; but this tendency is counteracted, or even overbalanced, by the reverse tendency to dispense with human labour through the improvement of agricultural methods of work, particularly through the increased use of machinery. On the other hand, our manufacturing industries, which are less dependent upon the natural restriction of the land area; and our trade, which is almost independent in this respect, — absorbed in a satisfactory way the large increase of the population. The following table gives a clear picture of this vast shifting compressed within a quarter of a century:

Callings by Groups	Years	Persons employed	Persons employed, including dependents	in Percentages of whole population	
				Persons employed	Employed and dependents
Agriculture and Forestry	1882	8 236 500	19 225 500	18.0	42.0
	1895	8 292 700	18 501 300	15.9	35.6
	1907	9 883 300	17 681 200	15.9	28.5
Industry	1882	6 396 500	16 058 100	14.0	35.1
	1895	8 281 200	20 253 200	15.9	38.9
	1907	11 256 300	26 386 500	18.2	42.5
Trade and Transportation	1882	1 570 300	4 531 100	3.4	9.9
	1895	2 338 500	5 966 900	4.5	11.5
	1907	3 477 600	8 278 200	5.6	13.3

From the table it is seen that there was a standstill, or even a slight reduction, in the agricultural part of the population, whereas the part engaged in industry (including mining and the building trade) and in trade and transportation showed, at the same time, a heavy increase.

In connection with this development there went a displacement as between the population of country and city. In cities of more than 20 000 inhabitants there lived —

in 1885:
8 600 000 persons, or 18.4 % of the whole population;
in 1910:
22 400 000 persons, or 34.5 % of the whole population.

The number of inhabitants in the large cities of more than 100 000 — which rose from 21 in 1885 to 48 in 1910 — amounted
in 1885
to 4 400 000 persons, or 9.4 % of whole population;
in 1910
to 13 800 000 persons, or 21.1 % of whole population.

That this shifting of the center of gravity of the population from country to town, from agriculture to industry, trade, and transportation, has its dark side, is generally recognised and is denied by nobody. But none the less can the fact be overlooked that it was only the expansion of our industries, our trade, and transportation, that made it possible on German soil to give labour and sustenance to the vastly increased population, to protect us from the misery of overpopulation, and to transform the natural growth of the population into a source of increasing wealth.

B. Technique.

All economic labour aims at making external nature contribute to the needs of man. That is just as true of the most primitive, aboriginal employment, — that of gathering roots and berries to appease hunger — as it is of production by means of the most highly developed equipment of modern technique, — as, for example, the production of cyanamide, or calcium nitrate, from the atmosphere to be used as an artificial fertiliser in agriculture and thus increase the food supply.

The productivity of economic labour, — in other words, success in the struggle with nature, is increased by means of technique and organisation.

Technique is the aggregate of consciously developed routine and method, knowledge and equipment, used by man in his labour.

The economic technique of former periods rested almost exclusively upon routine and practice. The enormous progress of modern economic technique is due to the splendid development of the natural sciences and the systematic application of scientific knowledge to economic labour. Physics, chemistry, and electricity (which overlaps the first two sciences), have outvied each other in their influence upon economic technique. German scientists and scholars have accomplished revolutionary results in these sciences, and, by discovering the law of the conservation of energy, have lifted all the natural sciences to the highest plane. But the German has not been satisfied to confine himself to pure science; our hermit poets and thinkers converted them-

selves more and more during the past century into practical creative workers; and an enormous expansion of activity has resulted from the progress of the pure and the applied natural sciences. This combination of knowledge, ability, and will forms the device under which Germany achieved its greatest successes during just these past twenty-five years. Our Emperor has ever taken a conspicuous interest in the sciences to which Germany's economic development owes such an infinite debt, and he has given them energetic encouragement; numerous and important suggestions, for example, owe their origin to his striking comprehension of the close connection between technical achievement and its foundation in science. This intelligent encouragement given by the Emperor for the public good finds its completest expression in the "Kaiser Wilhelm-Gesellschaft".

The development of the physical sciences, particularly the advancement of our knowledge of the laws of motion, resulted in the development of labour-saving machinery, which had begun as early as the eighteenth century (spinning-machines, mechanical loom, hoisting-machine, pumps, etc.). But it was only by utilising new motor powers, — at first steam, then electricity, and finally explosive power — that the decisive impulse was given to the application of labour-saving machinery and its further development. The invention of the steam-engine occurred as early as the eighteenth century; but its decisive improvement and the great extension of its practical application belong to the nineteenth. Important progress in the utilisation of steam power — for example, superheated steam and the steam turbine — are achievements of the very latest decades.

To what extent the use of steam-power has increased in Germany during the past quarter of a century — and this despite the fact that other kinds of power came more and more into competition with steam — is illustrated by the following figures:

In Prussia's industries the capacity of steam-engines amounted in 1882 to 1 222 000 horse-power, in 1895 to 2 358 000 h. p., and in 1907 to 5 190 000 h. p. In these twenty-five years therefore the capacity increased more than four-fold, and in the 12 years from 1895 to 1907 it was more than doubled. In the whole Empire, for which comparative figures are available only since 1895, the development was similar. In the year 1907 the census showed 124 000 steam-engines with a capacity of 7 587 000 maximum horse-power, or 5 185 000 effective horse-power. What these figures mean becomes clearer when we compare mechanical and human capacity for work. The effective capacity of one mechanical horse-power can be placed at about the equivalent of the physical labour-capacity of ten men. Upon this basis the actual work done by German steam-engines in the year 1907 was equivalent to the work done by 52 000 000 men; and the increase of actually effective steam horse-power from 1895 to 1907 was equivalent to an increase of the working population by about 28 000 000 men. These figures should be placed in juxtaposition to those of the working population of the Empire, already given above, which showed 18 900 000 persons for 1895 and 24 600 000 for 1908. In the year 1895 there was, accordingly, for each person engaged in labour not much more than one equivalent of his labour represented by steam power. But whereas the labouring population increased from 1895 to 1907 by 5 700 000 persons, the

steam-engines of Germany underwent an increase of 2 800 000 h. p.; hence the steam power in 1907 represented more than two equivalents of human labour for each person employed in gainful occupations.

In reality the increase of mechanical labour power was even considerably greater than finds expression in the above figures; for whereas steam was — along with water-power, which was relatively little developed — almost the exclusive source of power for motor purposes till into the last quarter of the nineteenth century, the development of the electrical industry and the invention and improvement of explosive motors has, during the twenty-five years under consideration, raised up a new and rapidly developing competitor for steam power.

The electric current, from which the transformation of motor technique during the past quarter of a century proceeded, found application at first and for a long time only in weak-current dynamics. The beginning was made with the invention of the electric telegraph in the third decade of the nineteenth century; it was not followed till three decades later by the invention of the telephone, and only most recently by that of wireless telegraphy and the wireless telephone. German scientists and German capitalists, as is well known, took a prominent part in the invention, perfection, and practical application of both telegraph and telephone.

The application of electricity in strong-current dynamics, which has produced in recent decades a complete revolution in power and labour-saving machinery, had its origin in the invention of the dynamo-machine, first constructed by Werner von Siemens in

the year 1867, and in the solution of the problem of power transmission immediately connected with that invention. For the practical use of these inventions there was still needed an enormous amount of detail work in the construction of alternating and continuous current generators, transformers, storage batteries, electrometers, etc. Full success was demonstrated to the world in the year 1891, when a water-power of about 300 h. p. was transmitted from Lauffen on the Neckar to the Electrical Exhibition at Frankfort-on-the-Main, a distance of 108 miles, with a current loss of only about 28 per cent. From that time we can date the establishment of electricity for power purposes, and not only for power purposes, but also as a source of light. The invention of transforming electrical energy into light, both in arc and incandescent lamps, is of remoter origin, indeed, but the practical utilisation of this invention was only possible after the discovery of the dynamo-electrical principle. The enormous advantages in the use of electrical energy depend upon power transmission, which makes it possible to utilise sources of power which, where nature placed them, had hitherto been economically worthless; furthermore, it lies in the almost unlimited divisibility, in an economically rational manner, of the power generated at a central point, and in its distribution to any place in any amounts desired.

Water-powers especially assumed a new importance alongside of the steam-engine as sources of energy. Water-power is not transportable like coal, which can be shipped from the mine to all points where the economic gain still outweighs the cost of transportation. Water-power must therefore be converted on the spot into energy that can be economically utilised; and there

has only been a possibility of doing this at a distance from the water-power itself since energy has become transportable in the form of the electric current.

The transmission of electricity, moreover, has rendered it possible to make an intense use of fuel which previously could not be used at all, or only slightly so. That is especially true of low-grade fuels, which would not pay the expense of long transportation, but can be burnt at the place of origin for generating steam, now that it is possible to transmit to great distances at little cost the energy thus generated.

But above all, the possibility of transmitting electrical power has shown extraordinary results in connection with the development of the gas-engine. By means of gas-motors the gas produced in making coke, which was at first used only for illuminating purposes, was also made available for generating power. The gas-motor next made it possible to convert other gases of slight heating value, like the gases escaping from blast-furnaces, into energy in a rational manner. During the decade just elapsed the use of large gas-engines in iron-works made enormous progress. The power generated in this way is usually enough, not only to meet the demands of the works themselves, but yields a surplus, which is sold to great electrical concerns. An excellent example of this development is found in the use of blast-furnace and coke-oven gas at the Friedrich Alfred-Hütte branch of the enormous Krupp Works. The festival volume recently issued by the firm in celebration of its centenary says on this subject: —

"During the time that elapsed between the beginning and the final completion of the works the blast-furnace gas-

engine began its triumphant course through the world. It was installed in the new works for all purposes for which it was found suited. To the older steam blowing-engines were now added eight larger gas blowing-engines, each with a capacity of 1 000 cubic meters per minute. Moreover, the electrical central station of about 5 000 h. p. and a part of the rolling-mills were driven by gas-engines. Inasmuch as steam power, which is even yet preferred for various purposes, is also produced by means of the blast-furnace and coke-oven gases used in heating the boilers; as a mixture of the two gases is employed in the open-hearth furnaces in place of generator-gas; and finally as the heating furnaces of the rolling-mill are built for heating with blast-furnace gas, — the direct consumption of coal has almost completely ceased in all departments of the iron-works. This extensive use of blast-furnace gas makes it necessary, of course, to clean it thoroughly beforehand. The dust that settles in the dry-cleaners during the cleaning process still contains so much iron that it is compressed into briquets and goes again into the blast-furnace."

A new field for the big gas-engine has just begun to be opened within a very few years through the invention of a practical process for gasifying peat, lignite, etc. The gases thus produced are transformed into electrical energy, which is distributed through district stations. Ammonia, as a valuable by-product, is saved in coverting peat into gas. Through this latest progress a new power-source of enormous extent has been opened, especially in the broad moors of Germany, the utilisation of which is today still in its most incipient stage. This source of energy is all the more important,

since the working-up of the peat transforms at the same time into arable land the moor areas, which have hitherto been almost worthless.

While the development of the big gas-engine, in which Germany is far ahead of all other countries, is immediately connected with electricity, the invention and perfection of other combustion-motors, also an achievement of the most recent years, has been independent of any such connection. This has been the case particularly with small motors for automobiles and air-ships, which have hitherto used benzine almost exclusively as fuel. The recent effort to replace benzine by benzol and other products of coal tar are promising. A new outlook is opened by the Diesel motor, which, in place of high-priced benzine, uses cheap crude oil as fuel, besides tar-oil and recently even coal-tar directly.

This brief survey may suffice to show to what extent hitherto unused natural sources of power have been pressed into the service of humanity in the course of the past twenty-five years. It is evident that this enormous abundance of newly-created motor-power must inaugurate a new epoch in the development of machinery. Both the possibility of great concentracion of power, such as is given in the bringing together of thousands of horse-power for a single result, and the posibility of distributing the power thus generated to various places and for varions purposes, as is the case especially with electrical energy, has opened up to mechanical engineering really immeasurable scope for development.

New tasks of immense proportions have arisen for the German machinery industry out of this im-

measurable extension of its sphere of activity; and at the same time the solution of the problems of motorial power has given it the means for executing those tasks in a splendid manner. Larger and more perfect types of machines have been developed for mining operations, for preparing and working up metals, for the textile and paper industries, for agriculture and the trades related to it, like breweries, distilleries, and sugar mills, and for the chemical industries. This is still more true, perhaps, of transportation appliances by water and by land, — locomotives, electrical motor-cars, freight and pleasure automobiles; above all, carriers by water, from the motor-boat to the gigantic vessels of the commercial and the naval marine. And, finally, man's inventive power has succeeded quite recently in conquering the air by means of the light combustion-motor. The air-ship and the flying-machine, the latest devices for overcoming space, have been added to our means of transportation by land and water, and have thus realized a dream thousands of years old.

The development of chemistry has most effectively supplemented the influence of physics and electrical theory upon economic technique.

The scientific investigation of the material constitution of bodies and their material transformations first acquired importance for purposes of production through Justus von Liebig's work in laying the foundations for vegetable physiology and agricultural chemistry. This supplied the basis for the modern theory of fertilising soils, to which agriculture owes a quite immeasurable expansion of its productive capacity. Although the foundations were laid in the first half of the nineteenth

century, still the greatest progress in practical application of this new knowledge has been made within the past few decades. The knowledge of the importance of phosphoric acid, potash, and nitrogen for preserving and increasing the fertility of the soil has given incalculable value to materials that had hitherto been disregarded.

In its enormous potash deposits Germany owns one great possession in advance of all other countries in the world. The production of potash has developed as follows: after having amounted to about 1 000 000 tons, worth 25 000 000 marks, at the end of the eighties, production rose by the end of the century to 3 000 000 tons, worth over 50 000 000 marks; and in the year 1910 it exceeded 8 000 000 tons, with a value of more than 100 000 000 marks.

Phosphoric acid and nitrogen in a form suitable for fertiliser purposes had for a long time to be bought almost exclusively from foreign countries in the form of nitrate of soda and guano. Here, too, a change in our favour has been brought about through recent technical progress. The extensive deposits of iron ore in Germany mostly contain phosphorus. This gave them a quality which was long felt to be a serious disadvantage; for the various processes for smelting and purifying iron, particularly the Bessemer process, which came into use in the fifth decade of the past century, made it possible to use only material nearly free of phosphorus. Through the Thomas-Gilchrist process, which was invented in the seventies and about which more will be said presently, iron could be dephosphorised, and, indeed, with the result that the slag used

to absorb the phosphorus, the socalled "Thomas slag", yielded a material for an excellent artificial fertilizer, what is called "Thomas phosphate flour". Since that time this phosphate flour is used in Germany in enormously increasing quantities.

Great progress has also been made in supplying the soil with the needed nitrogen, particularly through the recovery of cyanamide, or calcium nitrate, from the atmosphere, which was accomplished through electrical progress. In addition to this, ammonia is recovered as a by-product from the coking-process, as well as from the gasification of peat and lignite.

Our industries have derived advantages from the progress of chemical science at least as great as those received by agriculture.

The improvements in the production of iron have already been hinted at. While the method of production till far into the nineteenth century rested exclusively upon experience, the great and decisive improvements introduced since then are due almost wholly to a broadened scientific knowledge, particularly to investigations of the compounds of iron and carbon. The change from charcoal to mineral coal and to coke in blast-furnace work, furthermore the vast progress in steel production — from the charcoal process to the puddling furnace and then to the Bessemer process — rests upon this same basis. In the Bessemer process, as is well known, decarbonisation is accomplished by forcing hot air under enormous pressure through the molten mass of iron. The result is that twenty minutes suffice for making steel in this way, whereas it required about ten days with the charcoal process and about thirty-

six hours with the puddling furnace. It has already been mentioned that the Bessemer process — which had been rendered cheaper and more effective through the Siemens-Martin regenerative system — did not become available on a large scale for Germany till the eighties of the past century. This was rendered possible by the Thomas-Gilchrist method, which, by means of a basic process, frees the iron of its phosphorus contents. Within a very recent time the electric current is used to advantage in producing steel (electro-steel). The statistics of Germany's iron and steel production, which will occupy our attention later on, illustrate the enormous importance of this progress resting upon a scientific basis, although the effect has, in the main, been visible in Germany only within the past twenty-five years. Inasmuch as iron and steel are the most important materials for making machinery, vehicles, and railways, this progress represents at the same time one of the presuppositions for the entire development of our production and transportation.

The gigantic development of iron and steel manufacture finds a parallel in the triumphs of the modern chemistry of coal. That the production of coal was everywhere able to assume such huge dimensions as demanded by our age of machinery, with its incalculable need for fuel stuffs, is due to progress in the mechanical technique of mining; but this point is only mentioned here in passing. The fact of chief interest in connection with what was just said, is, that we have succeeded in obtaining from coal, particularly mineral coal, a series of substances, mostly hitherto unknown, of considerable economic utility, — and that without detriment to its usefulness for fuel purposes. The recovery of illumina-

ting gas in making coke out of mineral coal belongs to an even earlier period. On the other hand, the utilisation of coal-tar, a by-product in making coke, is an achievement of the past few decades. The compounds of carbon that can be produced from coal-tar have become the basis of important new industries, in which Germany, owing to its scientific progress, has hitherto enjoyed the unchallenged leadership. It is only necessary to mention the most important coal-tar products, like anilin and alizarin dyes, pharmaceutical preparations like aspirin and phenacetin, saccharin, and the various coal-oils.

The vast progress made in the spheres of iron-working and the utilisation of coal products is only mentioned as examples, — examples, indeed, of pre-eminent importance. Improvements similar to those made in the reduction of iron ore and in working up iron followed as a natural result with all other metals. With several metals the application of electricity has acquired special importance. We call attention especially to aluminium, the recovery of which from clay by the electrical process was lifted from a costly laboratory experiment to the level of a great industry; the development of this process has had a decisive effect upon the modern air-ship and aeroplane industries. The splendid development in the utilisation of coal-tar has its counterpart in the synthesis of organic dye-stuffs (artificial indigo), in the chemical manipulation of wood (cellulose), in the recovery of cyanamide from the atmospheric air, already mentioned, in the improvements based on progress in biochemistry, and in the industries based on fermentation processes (brewing, yeast manufacture, etc.).

Modern technique has thus succeeded — and that to a greater degree during the past twenty-five years than ever before — in making new forces and new materials subserve our economic purposes, in extraordinarily augmenting the effective work of forces through a more intensive utilisation of them and though a greater reduction in loss of power, and in cheapening, to a hitherto unsuspected degree, the production and manipulation of materials by means of more highly-perfected processes, which demand less time, power, and raw materials, and which recover for new uses the by-products and waste that were formerly considered worthless. All the spheres of economic life — primary production in agriculture and mining, the trades and industries that work up raw materials, the transportation of persons and commodities, and the dissemination of news — have all derived enormous advantages from the progress described above. The total effect may be summarised by saying that an enormously increased economic effect is produced, to a steadily progressing degree, with a lower expenditure of human labour, especially labour of the hand.

C. Economic Organisation.

Hand in hand with progress in technique — promoted by it and promoting it — went the development of economic organisation.

The organisation of economic labour is the systematic co-ordination of human labour and the material means of labour for the accomplishment of a specifie economic purpose. It rests in the main upon the two principles,

closely connected with each other, of division of labour and association of labour.

The division of labour is the separation of work into single partial operations, and the distribution of these latter among different workmen. Not only does the internal organisation of every great business undertaking rest upon the division of labour, but also the whole existing structure of public economy, with its grouping of men into separate callings. But the division of labour extends even further; it exists in world-economy by means of the reciprocal relations between the different nations as effected by means of the world's commerce. As with living organisms a gradation from the lowest to the highest species manifests itself in an intensified and highly-developed specialisation and differentiation of cells and organs, so also in the collective organism which we call a community of people.

The association of labour is the counterpart to the division of labour: the bringing together of a greater or less number of workmen for a specific economic purpose. The immense achievements of modern industry and modern trade and transportation are only possible upon a basis of the intelligent co-operative work of large bands, one may say of entire armies, of workers with hand and brain. An iron rolling-mill and a great ocean steamship are wonderful things, the building of which presupposes not only the achievements of modern technique, but also the centralised and orderly co-operation of numberless intellectual and physical workers.

Such co-operation in an extensive and complicated organisation presupposes, on its part, a thorough training

and discipline of the working force. The development of technique alone, which is based upon an extensive foundation of economic labour, necessarily leads to the progressive elimination of unskilled labourers and the substitution of skilled labourers for them. The oft-repeated assertion that the development of technique must make man himself a mere machine, is incorrect. Machinery relieves man of an enormous amount of manual labour, which would otherwise have to be performed by man himself, or which, for the greater part, could not be performed at all. The production and the service of machines that are all the time growing more exact and more complex make increasing demands upon the skill of the workman. The ever-widening importance of technique for the whole range of production has opened up new professions for intellectual workers equal in dignity to that of the scholar, the jurist, the physician, the artist, or the literary man, — the professions, namely, of the technological expert, the engineer, the scientific assistant in practical businesses. It is only fair to place these great advantages against the disadvantage that, in proportion as the division of labour progresses, the greater is the number of specific operations of a limited character falling to the individual. Everything considered, the development of technique does not tend to deaden, but to intellectualise economic labour.

What Germany has accomplished in the sphere of trade schools during the past decades, can only be indicated here. According to the general belief technical training has fully kept pace with the development of technique. Foreign countries look upon our trade schools as models and are exerting themselves

to achieve similar success by similar means. A prominent part in our military successes of the past century has been attributed to the German schoolmaster. The German schoolmaster has helped, indeed, and is still helping, to fight our economic battles. Not the schoolmaster alone, however, but also the non-commissioned officer; for the training of the school alone is not enough; discipline is just as necessary in every large organisation. At this point, too, Germany makes a favourable comparison with other countries. Whoever has had an opportunity to observe the various races at their economic labour cannot escape the impression that military service, to which the vast majority of German workers with hand and brain are subject, has a great influence upon co-operative work in large economic groups by accustoming men to order, punctuality, and discipline.

Economic organisation, however, means more than a combination of school-training and discipline for workmen. The greater the advancement of technique, the greater is the material equipment needed by labour. This material equipment — raw materials, semi-finished products, adjunct materials, tools, machines, buildings — constitute "capital" in the economic sense. The present order of society is based upon the free self-determination of individuals and upon the right of private property, including the material means of production. The organisation of every single business undertaking, as well as the organisation of the entire economic body, must therefore include capital; workingmen and the material means of production must be brought together into an "undertaking" in a way and manner suited to the end in view, and all the existing and

newly-created capital must be utilised in the most intensive manner possible. The organisation of capital has, in this respect, to solve problems quite similar to those of technique, which aims at making the forces and materials of nature, in the greatest possible abundance, serve our economic purposes.

To what degree the organisation of our public economy has been perfected during the past twenty-five years, to what degree it has increased the productive capacity of our economic labour and contributed toward enhancing the wealth of the people, can only be indicated here in large outlines.

The intensification of the division of labour within individual economic undertakings, especially industrial and commercial ones, — an intensification which has kept pace with the development of technique, — is a fact which forces itself at once upon the attention of every observer; and the same thing is true as to the development of the organisation of the German people into callings and professions, corresponding to the progressive division of labour. To what extent our public economy as a whole has grown, by means of the division of labour, into a larger unity, that of world-economy, is strikingly illustrated by the statistics of our exchange of merchandise with foreign countries. In the year 1912 our foreign trade reached a total of 19 600 000 000 marks, of which 10 700 000 000 marks fell to imports, and 8 900 000 000 marks to exports. Of our total imports in 1912 not less than 9 100 000 000 marks was in food products, animals, industrial raw materials, and semi-manufactured products, and only 1 600 000 000 marks in finished goods. On the other hand, not less than

5 800 000 000 marks of the total export value of 8 900 000 000 marks was in finished goods. Germany, accordingly, exchanges, to a very great extent, the products of its industrial labour for the primary products of field, forest, and mines, which, owing to the disproportion of its population to its area and the climatic restrictions upon its producing capacity, it can produce partly in only insufficient quantities, or partly not at all. The international division of labour finding expression in the foreign trade has therefore contributed in its development, not only toward giving the German people more abundant and more varied means for satisfying their wants, but has really created the conditions that made it possible for the great increase of the population during recent decades to find the means of subsistence on German soil.

The advantages of the association of labour, assisted by the development of capital organisation, have had the effect in numerous and important spheres of economic life, particularly in industry, trade, and transportation, of facilitating the creation of large productive units; and, in addition to this, of promoting the consolidation into centralised business undertakings of various branches having interdependencies among themselves in the processes of production.

The development in the dimensions of business undertakings is illustrated by the following table, which epitomises the results of the trade censuses of 1882, 1895, and 1907:

Number of Concerns and Persons Employed in them.

	1882		1895		1907*)	
	concerns	persons employed	concerns	persons employed	concerns	persons employed
Small concerns, 1—5 employés . .	2 882 768	4 335 822	2 934 723	4 770 669	3 124 198	5 353 576
Medium concerns, 6—50 employés .	112 715	1 391 720	191 301	2 454 333	267 410	3 644 415
Large concerns, 51 and more employés	9 974	1 613 247	18 953	3 044 267	32 007	5 350 025
Whereof giant concerns of 1000 and more employés . .	*127*	*213 160*	*255*	*448 731*	*506*	*954 645*
Total number of concerns	3 005 457	7 340 789	3 144 977	10269269	3 423 615	14348016

*) Not including music, theatres, and public amusements.

It appears therefore that of all persons engaged in gainful employments in 1882 59 per cent. were employed in small concerns, 18.5 per cent., in medium, and 22.5 per cent. in large concerns. In 1907, on the other hand, only 37.3 per cent. fell to the small concerns, 37 per cent. to the large, and 25.7 per cent. to the medium concerns. Whereas, therefore, more than two and one-half times as many persons were employed in small concerns in 1882 as there were in large ones, the two classes had almost reached a complete equilibrium by 1907. From 1882 to 1907 the number of persons engaged in small undertakings increased not fully one-fourth, whereas the number in the great concerns increased more than threefold, and those in the very largest concerns four-and-one-half-fold. In individual groups of callings this development was still more pronounced than in the general average; as, for example, in metal-working, in the machinery, instrument, and apparatus industries, in the industries of wood and wood-working, and in the building trades. In metal-working there were 288 000 persons employed in 1882 in small concerns, and only 85 000 in large ones. In the year 1907, on the other hand, there were only 272 000 in small concerns, and 440 000 in the large ones. In the machinery industry the ratio in 1882 was 123 000 to 166 000 persons; but in 1907 it was 136 000 to 788 000. In the building trades it was 245 000 to 95 000 in 1882, but 315 000 to 633 000 in 1907. In mining and smelting, in which small and medium concerns were quite insignificant already in 1882, not less than 832 000 out of a grand total of 861 000 persons employed in 1907 were in the large concerns.

The development of the second form of association

of labour, — that, namely, of bringing together various processes of production into a centralised undertaking — did not lag behind the shifting in the sizes of undertakings just described. The production of raw and secondary materials was united, on a large scale, with manufacturing concerns; businesses producing semi-manufactured goods found it to their advantage, in an increasing degree, to take in hand the production of finished goods; producing establishments annexed transportation undertakings, so far as these were not monopolised. This development was seen not only in industry, but also in agriculture, where dairies, distilleries, breweries, sugar factories have become, to an increasing degree, a part of the regular appurtenances of the great agricultural establishments. In our industries the most prominent movement of this kind — promoted especially by the syndicates, or trade combinations — is the amalgamation of coal mines and iron-works; the "iron-works coal mines" have completely thrust the simple iron-works and the simple coal mines into the background. The very largest undertakings, like Krupp, include coal mines, coking plants, iron mines, smelting works, and steel working, up to the manufacture of machines, cannon, other munitions of war, and armour-plate; also electrical works, river vessels for transporting coal and ores, and a high-sea fleet.

The enormous development in the association of labour, which finds expression in the great increase in the size of concerns and in the centralised organisation of related undertakings, had its prerequisite basis — to a certain extent even its cause — in the growth of capital, and in its mobilisation and concentration. The greater the business undertaking and the more

extensive its technical equipment, all the greater must be the capital working in co-operation with its labouring force. Conversely, the greater the amount of capital at hand, and the greater the possibility of concentrating huge amounts of capital for centralised business purposes, all the stronger is the tendency to develop, expand, and consolidate business undertakings in a rational way for the purpose of earning the largest possible profits.

Even a considerably greater increase in the capital supply would not have sufficed to furnish the financial foundations for the association of labour so enormously expanded, unless it had been possible at the same time to develop the means and forms for assembling and consolidating capital owned by numerous persons for a business purpose in a manner similar to the organisation of human labour itself. This was accomplished by means of the development of stock companies and the system of credit.

The company form of capital organisation — embracing the joint-stock company, the company "en commandite", the limited liability company, and the various co-operative organisations — enables the individual capitalist to participate, with the whole or with a part of his capital, in a great business undertaking by assuming the advantages and the risks of an owner. Amounts of capital dispersed among very many owners can therefore be brought together in the company form as a single operative capital; and the size of the capital so organised has thereby become independent of the amount owned by a single individual, or a single family; the smallest capitalist can participate in the greatest undertakings by owning stock in them. The develop-

ment of capital organisation in the company form will be illustrated here by a few figures.

In the year 1886-87 there were in Germany 2,143 jointstock companies and companies "en commandite", with an aggregate capital of 4876000000 marks. By the year 1907-08 the number of companies had grown to 4578 and their capital to 12788000000 marks; and in 1911-12 the companies numbered 4712, while their capital reached a total of 14880000000 marks. This development was especially marked by the increase of companies of great capital. Joint-stock and "en commandite" companies of more than 10000000 marks capital had the following development:

End of	1886-87	74 companies
„	1896	108 „
„	1906	208 „
Sep. 30,	1909	229 „

Companies of limited liability did not acquire a legal basis till the Imperial law of April 10, 1892, was adopted. In the year 1909 16508 such companies, having an aggregate capital of 3538500000 marks, were enumerated.

In the development of co-operative societies for trade and credit purposes, Germany admittedly holds the foremost rank. At present the number of co-operative societies exceeds 30000, and their membership amounts to more than 5000000.

Not less imposing are the amounts of capital mobilised by means of credit and infused into our business life.

The aggregate deposits of the German credit banks about the end of the eighties of the last century ranged between 1 300 000 000 and 1 400 000 000 marks; but at the end of 1912 they reached 9 360 000 000 marks.

The deposits of the co-operative societies around the end of the eighties were scarcely more than 600 000 000 marks. On the other hand, they exceeded 3 000 000 000 marks in the year 1912.

The aggregate amount on deposit accounts with the German savings-banks in the year 1888 was about 4 550 000 000 marks; but in the year 1912 the sum must have exceeded 18 000 000 000 marks.

Summing up the above we find that the total deposits with banks, co-operative societies, and savings-banks increased from about 6 500 000 000 marks to more than 30 000 000 000 marks during the past twenty-five years. For the most part this increase was due to the creation of new capital. A not inconsiderable part of the increase, however, is to be attributed to the fact that we have succeeded, by means of improved organisation, in attracting from its hiding-places capital that was formerly withdrawn from the channels of business. The capital thus rendered mobile is infused into business life in the form of loans on real or personal property; it has supplied a substantial part of the sums needed to "finance" the enormous prosperity in German economic life. The huge sums demanded by German industries, in particular, for the utilisation of technical improvements could only be obtained — owing to the comparatively small capital supplies with which Germany entered upon this development — by the most assiduous collecting and utilising of the capital already in existence

and that newly created. The danger of the excessive expansion of credits was ever at hand, owing to Germany's vast demands for working capital; and the danger-line has been grazed often enough. Upon the whole, however, our credit system has succeeded in holding the balance between the principle of safety and the principle of the most intense utilisation of capital.

The perfecting of our organisation of credit has still further intensified the effect of the company-organisation of our economic life. So far as capital was at hand at all there was scarcely a limit left to the combination of labour and capital to meet the requirements of technique and profit-earning. Now it was possible for establishments and groups of establishments to spring up, which united within themselves many thousands of workingmen and working capital to the amount of hundreds of million marks.

In order, however, to complete the picture of the development of economic organisation, another stroke must be added. Development did not stop with gigantic undertakings; it extended beyond these to greater organisations, embracing many similar or related undertakings; namely, to the syndicates, cartels, community-of-interest arrangements, etc. In contrast to the American trusts, which almost entirely absorb the individual undertakings, these combinations let the individual undertakings attached to them remain independent, and restrict themselves to enforcing certain controlling principles in regard to production, prices, and competition. They aim at removing, so far as possible, conflicts and losses which must necessarily result from an unplanned and disordered working of one

against the other; and they seek to unite all interests and intelligently secure for them the maximum of economic success. They are, in this respect, the climax of the development that our economic life has passed through, in its organisation, during the past few decades.

* * *

The development described above needs to be judged of, in connection with this description, from the standpoint of pure organising expediency. From this standpoint the development of the past twenty-five years appears to us as a mighty advance toward higher and more efficient life-forms of the economic body. If it be the goal of our economic development to produce an ever-increasing economic effect with a given quantity of human labour; to obtain a completer, more varied, more refined satisfaction of our material wants with the same — or better, with a slighter — expenditure of labour, — then we may say that the progress in organisation during the past twenty-five years has kept equal pace with the achievements of economic technique in bringing us nearer to that goal.

But nobody can ignore the fact that many new problems of the greatest importance have arisen through the transformation which not only our economic life, but also our people have experienced in their entire structure. The gradual shifting of the center of gravity of our population from agriculture to manufacturing and commerce, from the country to the cities; the growing predominance of the great undertakings over

medium-sized and small businesses; in connection with this, the decline in the number of persons enjoying economic independence and the ever-increasing army of employés and wage-earners; the accentuation of the conflict between labour and capital, between rich and poor — all these are problems, which have arisen out of the technical and organic development of our economic life, partly as new problems, partly as old ones that have grown enormously more important. The rapidity with which this development was accomplished was calculated to intensify the difficulties of the new problems; for, owing to the suddenness of the transitions and transformations, there was in many cases a lack of the necessary time in which to develop the natural counterpoises against the dangers growing out of those transitions and transformations.

Upon the successful solution of these problems will depend to a great extent the future of our people. We need not despair of such a successful solution.

The new problems — especially those connected with public hygiene, with housing the people, with social reform, with education and culture — have been taken up nowhere in other countries, confronted with these same problems through a similar development, with greater moral earnestness, with a stronger will-power, than with us. In no other country do the leaders of large undertakings recognise more fully their social obligations and responsibilities, in none of them did the State earlier or more energetically recognise the social question in its entire scope and place it among its duties. It is among the pre-eminent merits of our royal house that the Emperor and

Empress have ever been fully sensible of the high tasks growing out of the duties of humanity and responsibility for the future of the German people; that the work hitherto accomplished and the success hitherto achieved have been in large part due to their initiative and their energetic encouragement.

CHAPTER II.

Production, Traffic and Consumption.

A. Production.

The increase of the population, especially its productive part, the progress of economic technique, and the development of economic organisation during the past twenty-five years have caused an enormous increase in the production of commodities, traffic, and consumption, whether reckoned in absolute quanities or on a per caput basis.

Unfortunately it is not yet possible to give a statistical view of the development of production in its entirety. Attempts were made in the years 1897 and 1899, in preparation for the renewal of the commercial treaties then approaching, to collect general statistical data regarding Germany's production; only the chief results of the inquiry of 1897, however, have been published. A collection of production statistics on a considerably broader basis has been in progress since 1908, but their results have as yet been only partially published. But apart from the fact that comparisons extending over considerable periods are not at hand,

it should be borne in mind that statistics for successive periods covering all branches of production would by no means give a correct idea of the value of the total production of the country; for the value of finished manufactures includes that of the semi-finished materials used to produce them, the value of these latter includes the value of the raw materials consumed in their production, and all production values include the values of auxiliary materials used, like coal, fertilizers, etc., as well as the wear and tear of tools, machinery, etc. Trustworthy total results could therefore only be obtained by treating production statistics according to a complicated principle of net values, whereas our statistics of production have hitherto dealt, in the main, with gross values.

In a few important branches, however, our statistics suffice to give an exact view of the development of production. Thus we have consecutive official corp statistics and regular censuses of live-stock, from which a correct idea of the development of agricultural production can be obtained. Besides these we have at hand statistical records of production in mining and smelting, extending over long periods, and also for such products as pay an excise duty.

The development of technique and organisation in our economic life during the past few decades has naturally made itself felt chiefly in industrial production. Nevertheless, agriculture, — notwithstanding the fact that its prime factor of production is the arable soil, whose area can be increased only within narrow limits — has been able to make a quite substantial increase in its productive capacity. Improvements in the methods of tillage, so far as these rest upon the science of agri-

cultural chemistry, produced their strongest effects, indeed, as early as the first half of the past century, when, within a comparatively short time, the productivity of the soil was increased several times over. But the effects of these scientific methods still continued to be felt during the past twenty-five years; and other great achievements are near at hand, if we succeed in bringing our extensive moor areas into cultivation on a large scale. In the course of the past decades the improvement in farming methods on a scientific basis has been promoted by agricultural schools and co-operative societies; and it has been carried so far that those methods have really become the common property of German agriculture. Especially has extraordinary progress been made in intelligent irrigation and drainage, in the rotation of crops, and in the application of artificial fertilisers in combinations suited to the character of the soil and the demands of the various systems of cultivation. The consumption of commercial fertilisers in German agriculture increased from 1 600 000 metric tons in the year 1890 to 6 000 000 tons in the year 1910. The value of these fertilisers used in the latter year reached nearly 400 000 000 marks. The consumption of potash, in particular, increased during this period of twenty years from 220 000 tons to 2 220 000 tons; and the consumption of Thomas phosphate flour from 400 000 tons to 1 430 000 tons. On the other hand, the consumption of nitrate of soda, which is imported from abroad, only increased from 250 000 to 540 000 tons. Besides this, agriculture derived great advantages from the increased use of mechanical power; the use of machines of all kinds has been extraordinarily increased, especially since the progress of the electrical

industry in the establishment of district central stations has abundantly supplied agriculture with a cheap motor power in the form of the electric current. The number of agricultural establishments using machines has shown the following development: —

	1882	1895	1907
Ordinary threshing machines . .	268 367	596 869	947 003
Steam threshing machines . . .	75 690	259 364	488 867
Drilling and seeding machines .	63 842	169 465	290 039
Mowing machines	19 634	35 084	301 325
Fertiliser distributors	—	18 649	—
Steam ploughs	836	1 696	2 995

The increase that has occurred during the past quarter of a century in the production of the most important crops for the nutrition of man and beast, and the relation of the crops produced to the area planted are seen from the following table: —

	Average for the years 1883—87		
	Area planted hectares	Yield tons	Yield per hectare tons
Rye	5 830 000	5 867 800	1.00
Wheat	1 918 000	2 585 200	1.34
Summer barley	1 737 700	2 232 800	1.28
Potatoes	2 912 800	25 459 200	8.74
Oats	3 785 000	4 291 000	1.13
Meadow hay	5 905 100	16 874 600	2.85

	Average for the years 1908—12		
	Area planted hectares	Yield tons	Yield per hectare tons
Rye	6 168 261	11 012 171	1.78
Wheat	1 911 768	3 962 390	2 07
Summer barley	1 604 116	3 220 066	2.01
Potatoes	3 315 137	44 220 213	13.34
Oats	4 317 753	8 189 062	1.90
Meadow hay	5 949 237	25 024 865	4.21

In all cases we have here very substantial gains in the yield of crops against an only inconsiderable increase in their acreage and — as may be mentioned here — a standstill in the number of persons employed in agriculture. This is most striking in the case of rye, for which there was a gain of only 5.8 per cent. in the acreage from the one five-year period to the other, whereas the increase in the yield was 87,7 per cent. and the increase in the yield per hectare 77,7 per cent.

The result of the progressive improvement in farming methods has therefore been highly satisfactory. During the period of its vast industrial expansion Germany has experienced no curtailment in its production of food products, but has even increased it in a still higher proportion than the growth of the population. German agriculture has thus not only asserted its due position in German economic life, but it makes a splendid comparison with the other great agricultural lands. The following table gives the most important data for an international comparison: —

Harvest year		Aggregate yield of crops (in 1 000 000 tons)			
		Wheat and rye	Barley	Oats	Potatoes
1912	Germany	15.9	3.5	8.5	50.2
1912	Russia	42.6	9.9	14.1	36.9
1912	Austro-Hungary	11.2	3.3	3.6	18.5
1911	France	10.4	1.1	5.1	11.5
1912	Canada	5.4	0.9	5 6	2.2
1912	United States	20.8	4.9	20.6	11.4
1912/13	Argentine	6 4	—	1.7	—
1911/12	British India	8.4	—	—	—

Harvest year		Yield pro Hectare in metric cwt. (220 lb.)				
		Wheat	Rye	Barley	Oats	Potatoes
1912	Germany	22 6	18 5	21.9	19.4	150 3
1912	Russia	6.9	9.0	8.7	8.5	81.7
1912	Austro-Hungary . .	15.0	14.6	16.0	13.0	100.2
		12.7	11.6	13 9	10.4	84 4
1911	France	13.8	14.3	14.3	12.6	74.2
1912	Canada	13.7	12.0	16.7	15 0	115.8
1912	United Staates . .	10.7	10.6	16.0	13.4	76.2
1912/13	Argentine	9.3	—	—	14.1	—
1911/12	British India . . .	8.7	—	—	—	—

So far as total production is concerned, Germany holds the third place in the production of wheat and rye, while Russia has a long lead, and the United States a small one, over Germany; Austria and France follow with about two-thirds of the German crops. In barley Germany also holds third place, after Russia and the United States, with a small lead over Austro-Hungary. Germany has no competitor for the third place in oats; and in potatoes Germany is far ahead of all other countries.

Germany exceeds all other countries without exception in respect to the yield per hectare, — and that for the most part by a very substantial margin. Inasmuch as neither the character of her soil nor climatic conditions are in Germany's favour in such a comparison, the above figures signify great technical superiority of Germany's agricultural methods. German agriculture can be all the more proud of its splendid achievements, since these were accomplished in part under very difficult conditions and in competition with newer agricultural countries, which operated with cheap and virgin soil and cheap labour, and which at times — particularly in the last decade of the past century — threw their products in enormous quantities and at ruinously low prices upon the European markets. The commercial policy of the Empire, indeed, has given energetic assistance to German agriculture in the shape of high protective duties; but the figures given above show that German agriculture has not stood on the defensive behind the tariff-wall, but through intelligence and perseverance has raised its productivity to a level reached nowhere else.

The production of the sugar-beet has grown more rapidly even than the cultivation of the other food

plants. As the raw material for one of the most important articles of consumption this plant acquired in the course of the past century, thanks to the progress of chemical technique, an enormous importance, not only for our home production, but also for the whole world's market.

The discovery of the sugar contents of the beet-root, which was made by a German scientist, and the technical improvements in the cultivation of the roots and in the manufacture of sugar from them created a new branch of production, in which Germany ranks today as the first country in the world. In the year 1911-12 the production of beet-root sugar in Germany amounted to 2 701 000 tons, in Russia to 1 374 000 tons, in Austro-Hungary to 1 902 000 tons, in France to 960 000 tons, while the other countries followed at a wide remove.

The development in the cultivation of the sugar-beet and in the manufacture of sugar in Germany during the past twenty-five years is shown by the following table: —

Crop year	Beets worked up 1000 tons	Area in beets hectares	Yield of beets per hectare tons	Raw sugar produced 1000 tons	Average of beets required to make 1 kilogramme of sugar kilogr.
1875/76*)	4 161	96 724**)	29	358	11.62
1888/89	7 896	149 411**)	28	991	7.97
1910/11	15 749	477 909	33	2590	6.08

*) The year 1911/12 cannot be used for purposes of comparison, inasmuch as the abnormal heat and drouth of the year caused an almost unprecedented failure of the sugar-beet crop in Germany. Germany's yield of sugar for that year was only 1 348 000 tons, as compared with 2 590 000 tons for the previous year and about 2 700 000 tons for 1912/13.

**) Only the area of beets produced by the factories themselves.

Not only has there been a substantial extension of the area devoted to beets, especially within the past twenty-five years, but also along with this went an increase of the yield in consequence of more rational methods of cultivation. Hence the production of beet-roots is today about twice as great as it was about the end of the eighties of the last century. But beyond this, improvements both in cultivation and in the manufacture of the beets into sugar have had in the past twenty-five years the result, — notwithstanding the the substantial progress already made in this respect prior to the end of the eighties — of further reducing, by almost one-fourth, the quantity of beets required for producing a given weight of sugar. Thus it happens that, whereas the production of beets has only been doubled, the make of sugar has been increased more than two-and-a-half-fold.

In addition to the immediate profits derived by German agriculture from the increased production of beet-sugar, the cultivation of the beet-root has brought it large remoter advantages. The intense and intelligent cultivation required by the beets proved everywhere an advantage for the other branches of agriculture. Besides this, the manufacturing process leaves large quantities of residues, which find application especially as feed-stuffs for animals, with excellent results on the livestock industry.

The development of the German livestock industry is illustrated by the following figures: —

Date of census	Horses	Mules & asses	Cattle	Sheep
Jan. 10, 1883	3 522 545	9 795	15 786 764	19 189 715
Dec. 1, 1892	3 836 273	6 703	17 555 834	13 589 662
Dec. 1, 1900	4 195 361	7 848	18 939 692	9 692 501
Dec. 2, 1907	4 345 047	11 291	20 630 544	7 703 710
Dec. 2, 1912*	4 516 279	12 862	20 158 738	5 787 848

Date of census	Swine	Goats	Poultry	Hives of bees
Jan. 10, 1883	9 206 195	2 640 994	—	1 911 797
Dec. 1, 1892	12 174 442	3 091 508	—	2 034 485
Dec. 1, 1900	16 807 014	3 266 997	64 453 171	2 605 350
Dec. 2, 1907	22 146 532	3 533 970	77 103 045	2 594 690
Dec. 2, 1912*	21 885 073	3 383 971	82 474 317	2 619 891

Comparing the numbers for the years 1883 and 1892 with those for 1907 and 1912, we find a reduction only in sheep, — and this, indeed, of considerable dimensions. On the other hand, horses show a very favourable development, cattle more so, and swine most of all, down to the year 1907. From 1907 till 1912, indeed, there was a small reduction in the number of cattle, swine, and goats; but this is probably to be attributed to the poor crops of feed-stuffs in the year 1911. The keeping of sheep depends upon having extensive pasture-lands at hand, whereas the development of German agriculture is in

*) Preliminary numbers.

the direction of intensive cultivation. The other branches of the animal industry have derived far greater advantages from this increased intensity than the mere statistics of the number of animals indicates. Progress in the improvement of breeds, and thereby in enhancing the production of meat and milk by means of more scientific breeding and feeding, has been extraordinary. The covering of the increased cost involved in conducting the livestock industry in a more scientific and more intense way was rendered possible by the growing demands for animal products on the part of the industrial population, which was steadily increasing in numbers and in purchasing power, and by the development of local markets going hand-in-hand with the industrialisation of the country. In this way the German livestock industry has also contributed its part toward enhancing the productivity of German economic life and toward increasing the general wealth.

The industrial development of our time rests upon those two mighty pillars, coal and iron. Germany is one of the lands which nature has richly endowed with these two primary materials of industry. Germany also possesses considerable supplies of other important minerals, especially salts, and zinc, lead, and copper ores. In recent generations we have learned how to recover these minerals and to utilise them more and more perfectly. During the past twenty-five years the value of the direct products of German mining (coal, ores, salts) have increased from about 700 000 000 marks to considerably more than 2 000 000 000 marks. Coal mining alone showed the following development: —

	Coal			Lignite			Total coal production		
	Average number of miners	Production amount Mill. tons	Production value Mill. marks	Avg. numb. of miners	Production amount Mill. tons	Production value Mill. marks	Average number of miners	Production amount Mill. tons	Production Value Mill. marks
1887	217357	60.3	311.1	29408	15.9	40.2	246765	76.2	351.3
1911	628307	160.7	1572.6	72567	73.8	183.5	700874	234.5	1756.1
	410950	100.4	1261.5	43159	57.9	143.3	454109	158.3	1404.8
Percentage of increase	189.1	166.5	405.5	146.8	364.1	356.5	184.0	207.7	399.9

The year 1912 showed still further progress. The production of coal rose to 259 400 000 tons (177 100 000 tons of pit-coal, and 82 300 000 tons of lignite).

Germany's coal production has accordingly been increased three-fold during the past twenty-five years.

Among producing countries Germany occupies the third place, after the United States and England, as shown by the following table:

Countries	Coal production (including lignite) in 1 000 000 tons		Per-centage of increase
	1886	1911	
United States	103.1	450.2	336.6
Great Britain and Ireland .	160.0	276.2	72.6
Germany	73.7	234.5	218.1
Austro-Hungary	20.8	49.2	136.5
France	19.9	39.3	97.5
Belgium	17.3	23.1	33.5

The United States, which still occupied the second position in 1886, are now far in the lead. But Germany has now nearly overtaken England, which occupied the first position twenty-five years ago with a production more than twice as great as ours. In the year 1912

Germany's coal production was 259 400 000 tons, and that of Great Britain and Ireland 264 700 000 tons (preliminary figures). The reduction of the output in England was in part due, however, to the strike of coal miners.

About one-fifth of the total coal production of the world today falls to Germany.

The expansion of the iron Industry has been not less remarkable.

The production of iron ores within the German customs union (including Luxemburg) amounted

in the year 1887 to 10 664 000 tons,
in the year 1911 to 29 879 000 tons,

or a three-fold increase.

Nevertheless, our home production of ores was not near enough to supply the requirements of our furnaces, and they had to be supplemented by a steadily increasing import of foreign ores, as the following table shows:

Iron Ores.

	Imports	Exports	Excess of	
	1000 tons		exports	imports
1887	1 036.2	1 744 6	708.4	—
1912	12 120.1	2 309.6	—	9810.5

The production of pig-iron developed as shown by the next table:

Pig-iron Production.

	Furnaces in operation	Average number of workmen employed	Raw materials smelted 1000 tons	Total production of pig-iron	
				1000 tons	Mill. mark
1887	212	21 432	12 057	4 024	166.4
1911	313	47 546	45 068	15 574*)	867.9
Percentage of increase	45.6	121.5	273.8	287.0	421.6

*) The production of pig-iron in 1912 was 17 853 000 tons.

The production of pig-iron in Germany during the past quarter of a century has accordingly been increased more than four-fold.

Germany now occupies the second place among producing countries, as shown by the following table:

Pig-iron Production (in 1000 tons).

Countries	1887	1911	Percentage of increase
United States	6 520	24 028	368.5
Germany	4 024	15 574	387.0
Great Britain and Ireland	7 681	10 033	30.6
France	1 568	4 411	281.3
Russia	612	3 588	486.3
Belgium	756	2 106	178.6

Here, too, the United States, by reason of their enormous deposits of ores, are far in advance of other countries.

Germany, whose production twenty-five years ago was only a little more than half of that of the United Kingdom, which then occupied the first position, had a production of more than 10 000 000 tons of pig-iron in the year 1903 and thereby exceeded England's production for the first time; but since that time the German production has increased to more than 15 800 000 tons in 1911 and 17 000 000 tons in 1912, whereas England's production has remained at about 10000000 tons.

The world's production of pig-iron now amounts to about 75 000 000 tons, of which about one-fourth falls to Germany.

The next table gives a view of steel production in the most important countries:

Steel Production (in 1000 tons).

Countries	1886	1910	Percentage of increase
United States . . .	2 604.4	26 512,4	910.3
Germany	954.6	13 698.6*)	1 335.0
Great Britain . . .	2 403.2	6 106.8	154.1
France	427.6	3 390.3	692.9
Russia	241.8	2 350.0	871.2
Belgium	164.0	1 449.5	783.6

The development of coal mining and iron production has here been sketched in large outlines as the basis for the total development of German industry. A more detailed view of the various branches of production is not possible, owing partly to lack of space, and partly to lack of statistical data. In order, however, to give at least a general view of the development of various branches of industry, the next table (p. 65) has been compiled to show the number of persons employed and the steam power applied in the various groups.

The building trade, whose task is to supply houses for the vast increase of our population and factory buildings for the enormous expansion of all our industries, shows the most rapid increase, with a gain in persons employed from 533 000 to 1 576 000. Large absolute and relative gains are also shown by the machinery industry, metal-working, mining and smelting, the industries of earths and stone, and wood and wood-working. These industries also show a considerable gain in the application of mechanical power. A very handsome gain in the absolute number of persons employed is also shown by

*) In the year 1912 Germany's steel production was 15 019 300 tons.

Industries	Persons employed				Steam power (in h. p.)			Electrical power 1907 in 1000 kilowátts
	1882	1895	1907	Percentage increase 1882—1907	1895	1907	Percentage increase 1895—1907	
Mining, smelting, and saltworks (also wire-drawing for 1882) .	430 134	536 289	879 600	104.5	995 069	2 332 968	134.5	422 782
Stone and earths . . .	349 196	558 286	747 057	111.1	197 796	503 682	154.7	88 570
Metal-working	459 713	639 755	905 868	97.1	142 141	443 224	211.8	128 909
Machinery	356 089	582 672	1 171 783	229.1	184 821	1 215 512	557.7	225 026
Chemicals	71 777	115 231	167 670	133.6	83 587	192 905	118.9	42 288
Illuminating materials (fats, oils, soap etc.) .	42 705	57 909	95 957	124.7	29 942	77 265	158.1	13 368
Textiles	910 089	993 257	1 094 955	20.3	515 583	886 373	71.7	75 126
Paper	100 156	152 909	225 046	124.7	201 422	412 908	104.9	54 966
Leather	121 532	160 343	206 313	69.8	32 377	85 304	163.5	19 302
Wood and wood-working	469 695	598 496	736 424	56.8	203 235	346 024	70.3	56 325
Foods, beverages etc. .	743 881	1 021 490	1 260 580	69.5	686 263	1 185 819	72.8	152 763
Clothing trade and cleaning	1 259 791	1 390 604	1 562 382	24.0	19 235	54 852	185.2	18 999
Building trade . . .	533 511	1 045 516	1 576 804	195.6	46 274	189 117	308.7	21 497
Printing, art reproduction etc.	85 394	147 746	243 262	184.9	18 793	35 974	91.4	40 950

the food and beverage industries. The chemical industry had large relative gains, while its absolute figures were smaller; this was also true of printing and art reproduction, the paper trade, the industries of illuminating materials, etc., and the leather industry. The slowest growth, relatively, was shown by the textile industry, although its numbers are stately and respectable, and by the clothing and cleansing trades.

A similar picture is seen in the figures showing the exports of our various industrial products.

The highest position in exports is held today (i. e. for 1912) by machinery, with an export value of 630 300 000 marks, as compared with 52 800 000 marks in 1887. The various classes of coarse and fine iron goods represent today a total export value of 580 900 000 marks, against 96 000 000 marks in 1887. Bars and angles, slabs and plates, blooms, steel rails, beams, wire, etc., show similar total results. There was an export of 65 100 000 marks in motor-cars for personal use, although this trade did not exist at all twenty-five years ago. The value of coal exported amounts today to 436 600 000 marks, as compared with 79 900 000 marks in the year 1887; coke to 126 400 000 marks, against 9 400 000 marks. The export values of aniline and other coal-tar dyes is now 133 800 000 marks, against 42 500 000 marks in 1887; artificial indigo 45 200 000 marks, against 6 300 000 marks. But the export of some finished and semi-finished textile goods has also considerably increased in twenty-five years: namely,

Cotton goods from 67 300 000 marks to 421 600 000 marks
Woolen do do 177 600 000 do do 253 400 000 do
Silk do do 16 100 000 do do 190 900 000 do

Woolen yarns do 34 000 000 do do 84 200 000 marks
Cotton do do 17 700 000 do do 64 100 000 do

These figures show that the textile industry — like agriculture — was able to increase its production strongly, notwithstanding the fact that the number of persons employed in it remained relatively little changed.

It would be a mistake, however, to assume that the increase in our producing capacity in manufactured goods is fully expressed in the gain of exports. General observation and scientific investigations of a detailed character combine to show that the home market for our industrial products has developed even more rapidly than our foreign sales. It would be rather a too low than a too high estimate if we assume that the producing capacity of German manufacturing industries has been increased three-fold in the past twenty-five years.

B. Traffic.

Unfortunately it is not possible to illustrate the development of the home market with such precise statistical data as we did for the foreign trade. Nevertheless, the Traffic statistics will suffice for forming trustworthy deductions.

We have, in the first place, figures showing the increase in the number of persons employed in trade and transportation, — namely, 1 570 000 in the year 1882 and 3 477 600 in 1907 — an increase that was relatively greater even than that of the industrial population. The mercantile calling, which carries on the exchange of commodities, and transportation, which removes them from place to place, merit the designation "productive" just as well as the callings that undertake primary production and the working up of raw materials. Their

activity, indeed, is not directed toward changing the substance of commodities; but they have the effect, just like such an activity, of increasing the value of commodities by bringing them to places where they shall acquire an enhanced utility — whether in the further processes of production, or for direct consumption. The further the division of labour among different callings progresses, and the larger the territories covered by interlocking business relations, — all the greater becomes the importance of trade and transportation.

The increase of trade and transportation in their entirety cannot be put into uniform figures. One is compelled here, too, to rely upon deductions drawn from certain developments that can be expressed in statistics.

Post-office Business within the Empire.

(Imperial Post-office, Royal Bavarian Post-office, and Royal Württembergian Post-office.)

	Mean Population	Number of Post-offices	Letters received (millions)	Ordinary packages (value undeclared) (millions)	Registered letters and Packages (value declared) (millions)	Post-office money orders
1887	47540000	19476	1303.4	93.7	11.3	3947 5
1911	65390000	40987	5994.3	271.3	11.8	9302.1*)
Increase, per cent	37.5	110.4	359.9	189.5	4 4	145.6

*) The highest figure was reached in the year 1908 with 12 766 300 000 marks. Since that time the business in post-office money orders has fallen off as the natural result of the establishment of the system of post-office check accounts.

Telegraph and Telephone Business in the Empire.

	Number of telegraph-offices	Length of lines (in 1000 kilometers)	Length of wires (in 1000 kilometers	Telegrams received (in thousands)	Number of towns with telephone systems	Length of telephone lines (in 1000 kilometers)	Length of Thelephone wires (in 1000 kilometers)	Number of connections made (in millions)
1887	14565	89.1	317.1	17860	188*)	6.7*)	56.4*)	155.6*)
1911	46444	228.6	1907.2	49643	37970	117.6	5022.8	2074
Gain (per cent)	218.9	156.6	501.5	178.0	—	—	—	—

As all trade, developed beyond its primary stages, depends upon the exchange of news, the development of the latter supplies a measure of the increasing intensity of the former.

The receipts of the post-offices from postage and from telegraph charges amounted in the year 1911 in round numbers to 784 000 000 marks, against 190 000 000 marks for the year 1887.

The best insight into the develepment of the exchange of values can be had from the money and credit movement, for in our economic order of things the one deis of every transaction finds expression in a sum of money.

As a large part of business transactions is settled by means of bills of exchange, the figures showing the bill circulation supply an important index. The aggregate amount of bills placed in circulation in

*) End of 1888.

Germany in 1887 was, in round numbers, 12 000 000 000 marks; in 1912 it was 34 000 000 000 marks.

The turnover in ordinary banking business ("giro" and check transactions) has even shown a much greater increase. The "giro" business of the Reichsbank has expanded within twenty-five years from 58 800 000 000 marks to 371 200 000 000 marks; and its total turnover rose from 79 800 000 000 marks to 414 000 000 000 marks. That of the Deutsche Bank, our largest private bank, rose from 18 100 000 000 to 132 200 000 000 marks.

The volume of commodities exchanged is fully illustrated by the statistics of transportation facilities.

The German railway system has been considerably developed within the past twenty-five years, in order to handle the rapidly expanding passenger and goods traffic; its work has been increased many times over.

Railways of Standard Gauge in Germany.

	1885	1911	Increase %
Length of railways, kilometers .	37 190	59 763	60.7
Capital invested (million marks)	9 722	17 833	83.4
Officials and labourers	333 439	713 187	113.9
Locomotives and power-cars . .	12 450	28 088	125.6
Passenger wagons	22 735	59 857	163.3
Goods and luggage wagons . .	250 640	596 763	138.1
Gross receipts (mill. marks) . .	997	3 271	218.0
Goods carried (in 1 000 000 ton-km)	16 600	61 870	272.7
Persons „ 1 km (in millions)	7 932	37 855	377.1

How far Germany has outstripped its western neighbors in the expansion of its railway system is illustrated by the following table: —

Comparative Railway Development.

	Length of Railways in Operation, in kilometers end of		Increase in %	Length of Railways per 100 sq. km. of area		per 10 000 inhabitants	
	1890	1911		1890	1911	1890	1911
Germany	42 869	61 936	42.6	7.9	11.4	8.7	9.5
England	32 297	37 649	16.4	10.3	12.0	8.5	8.3
France	36 895	50 232	33.9	7.0	9.3	9.6	12.8
United States . . .	268 409	396 860	44.6	3.0	4.3	42.7	43.1

	Capital invested (in mill. marks) end of		Passengers carried one kilom. (in millions)		Goods carried one kilom. (in mill. tons)		Total revenues (in mill. marks)	
	1895	1910	1895	1910	1895	1910	1895	1910
Germany . .	11 407	18 664	14 344.1	37 613.7	25 486.4	53 803.8	1 513.9	3 092.3
England . . .	20 022	26 370	—	—	—	—	1 730.2	2 485.5
France . . .	12 471	15 099	10 671.0	20 976.8	12 914.1	27 733.0	1 003.7	1 813.7
United States .	46 595	77 352	19 940.4	54 846.0	139 379.6	425 076.7	5 217.1	13 211.5

In addition to the railways our inland waterways, which are called upon to supplement our railway system and relieve it of the great mass of heavy goods, have been especially encouraged and developed during the reign of our Emperor, and upon his own initiative. In the year 1910 goods to the amount of 91 000 000 tons were carried on the German internal waterways. Of vessels of all kinds in internal transportation there were 20 390 in the year 1887 and 26 235 in 1907; but in the same period the carrying capacity of vessels was increased considerably more than their numbers: in 1887 the capacity of 19 989 vessels, for which we have statistical data, was 2 100 000 tons; but in the year 1907 26 191 vessels had an agregate carrying capacity of 5 900 000 tons.*)

The development of the transportation business in connection with our trade with foreign countries forms a worthe counterpart to that of our home trade on the railways and internal waterways.

Some figures showing the volume of business in our foreign trade have already been given in another connection. The development of the entire foreign trade of the territory covered by the German customs system from 1887 to 1912 is shown in the following table: (page 73.)

The aggregate turnover in Germany's imports and exports within a quarter of a century has increased from 6 246 000 000 marks to 19 648 000 000 marks; or, if we include the precious metals, from 6 379 000 000 marks to 20 117 000 000 marks.

---

*) The results of the enumeration of 1912 are not yet known.

I. Germany's Foreign Trade.

	Imports				Exports			
	1887	%	1912	%	1887	%	1912	%
	(in million marks)							
Raw materials for industrial purposes, including partly finished goods	1310.3	42.1	5882.6	55.0	585.2	18.7	2370.6	26.5
Manufactured goods	833.0	26.8	1608.2	15.0	2051.8	65.4	5787.5	64.6
Foods, beverages, etc.	965.7	31.1	2944.6	27.6	499.9	15.9	789.8	8.8
Animals			256.0	2.4			8.9	0.1
Totals	3109 0	100.0	10691.4	100.0	3136.9	100.0	8956.8	100.0
Also precious metals	77.4		325.7		56.1		142.7	

II. Foreign Trade of other countries (in million marks).*)

Country	Imports			Exports			Total Trade		
	1887	1912	Increase %	1887	1912	Increase %	1887	1912	Increase %
German customs territory	3109.0	10691.4	243.8	3136.9	8956.8	185.4	6245.9	19648.2	214.7
United Kingdom	6187.8	12914.4	108.7	4533.7	9943.7	119.3	10721.5	22858.1	113.1
United States	2870.4	6800.9	136.9	2952.7	9115.3	208.6	5823.1	15916.2	173.3
France	3261.1	6360.7	95.0	2629.7	5309.1	101.8	5890.8	11669.8	98.1

*) In part preliminary figures.

To complete the picture a comparative view (table II) of the foreign trade of the principal commercial countries is given.

Germany's foreign trade has grown more rapidly, as is seen here, than that of the other countries, even than that of the United States. Ours gained more than threefold, that of the United States two-and-three-fourths times, England's was somewhat more than doubled, and that of France not quite doubled. Whereas Germany's foreign trade in 1887 had just surpassed that of France by a small amount, it now exceeds it by more than half; and whereas it was then not much more than half of England's trade, it is now 85 per cent of it.

This vast development gives expression to, and at the same time serves as a measure of the extraordinary expansion of the producing capacity of our manufacturing industries. Whereas agriculture, by reason of the natural limitations upon its conditions of production, could not wholly keep pace, notwithstanding the exertion of all its powers, with the increasing food requirements of our rapidly growing population, our industries were able to increase their production far beyond the considerably expanded demands of the home market. They have succeeded, by reason of the excellence and cheapness of their products, in opening foreign markets more and more for their surplus production, and thereby they obtained the means to pay for our imports of food products and raw materials, which increase with our population and our industries.

The exchange merchandise with foreign countries is carried on for the most part through our commercial marine. The enormous expansion of our commercial fleet is shown in the following table:

The German Commercial Marine.

	January 1, 1888			January 1, 1913		
	Number	Net register tons	Sailors	Number	Net register tons	Sailors
Sailing ships	3034	758 359	21 053	2420	396 904	12 980
Sea-going lighters .	60	11 459	167	332	101 324	1 053
Steamships .	717	470 364	15 856	2098	2 655 496	63 713
Totals	3811	1 240 182	37 076	4850	3 153 724	77 746

While the number of ships increased about one-fourth, the net tonnage of the German commercial fleet increased two-and-a-half times, and the number of sailors was more than doubled. At the same time the capacity of shipping was greatly enlarged by reason of the substitution of steamships for sailing vessels. In 1913 the net register-tonnage of steamships was six times as great as in the year 1888; and whereas the tonnage of steamers at that time was only about three-fifths as great as that of sailing vessels, it is now nearly seven times as great.

Out of a gross steam tonnage amounting to about 4 400 000 tons on January 1, 1913, about one-fourth was represented by steamers less than five years old, and more than half by steamers less than ten years old.

The sea-going traffic at German seaports has developed as follows:

		Merchant vessels carrying cargo			
		Arrived		Cleared	
		number	Register tons	number	Register tons
To and from German ports	1887	29 359	1 675 498	28 564	1 661 471
	1911	56 554	5 397 913	55 795	5 495 791
To and from other European ports	1887	18 891	5 917 242	14 995	4 467 353
	1911	41 443	15 330 757	23 441	8 975 655
To and from non-European ports	1887	1 874	2 248 187	1 517	1 837 702
	1911	2 857	8 339 385	2 055	6 629 735
Totals	1887	50 124	9 840 927	45 076	7 966 526
	1911	100854	29 068 055	81 291	21 101 181

The above figures are a further confirmation of the development shown by statistics of our foreign trade.

In this case, too, we give a comparison of Germany's development with that of the most important countries competing with us, as follows:

Germany occupies, in respect to total sea-going tonnage, the third position, — at a long remove, indeed, behind the United Kingdom, and even with a considerble one behind the United States. In respect to steam tonnage alone Germany has won a slight lead over the United States and therefore occupies the second position.

Commercial Fleets of Leading Nations.

		Sailing ships		Steamships		Sailing and Steam	
		number	1000 Register tons	number	1000 Register tons	number	1000 Register tons
Germany	1885	3 438	854,9	664	420,6	4 102	1 275,5
	1911	2 723	510,0	2 009	2 513,7	4 732	3 023,7
United Kingdom	1885	17 018	3 457,0	6 644	3 973,0	23 662	7 430,0
	1911	8 714	971,7	12 205	10 711,4	20 919	11 683,2
United States	1885	18 564	2 771,0	5 399	1 494,0	23 963	4 265,0
	1912	10 969	2 147,7*)	10 309	2 470,6*)	21 278	4 618,3*)
Norway	1890	6 760	1 503,0	672	203,0	7 432	1 706,0
	1910	1 205	630,3	1 842	895,9	3 047	1 526,2
France	1885	15 266	1 000,0	937	492,0	16 203	1 492,0
	1911	15 949	624,5	1 780	838,1	17 729	1 462,6

*) gross tons.

These figures may be supplemented by giving a comparative view of the ocean-going traffic of leading seaports of the world. The following table shows the clearances of steamships in 1911 at the ports named:

	Aggregate clearances of steamers	Clearances for foreign ports
Hamburg, net reg.-tons .	13 177 000	11 993 000
London	19 516 000	11 172 000
Liverpool	14 563 000	10 445 000
Antwerp*)	—	13 326 000
Rotterdam	—	10 599 000
Marseille	9 660 000	8 619 000
Genoa	7 433 000	5 922 000
Trieste	4 246 000	2 713 000
New York (1911/12) . .	—	13 549 000

So far as foreign traffic is concerned, Hamburg is exceeded only by Antwerp*) — whose import and export trade is largely for German account — and New York.

Notwithstanding the fact that Germany's seacoast is restricted and its conformation less favourable than that of other countries, Germany has won through persistent energy and unceasing labour a dominant position on the oceans of the world. The natural con-

*) The measurement of tonnage at Antwerp is according to a somewhat different system from that prevailing at Hamburg. After correcting the Autwerp figures accordingly its total clearances would be rather smaller than those of Hamburg.

ditions which 400 years ago, after the discovery of the New World and the sea-route to India, diverted the world's trade from Germany into other channels, have remained unchanged. But a transformation, proceeding from within, has been accomplished, creating for us a position in the world's commerce far beyond all former conceptions. Formerly commerce was fed from without, from the real and supposed wealth of over-sea regions; and thus, when that wealth flowed into other channels to other countries, we lost our position in the world's commerce. Today we carry within us the power on which our foreign commerce rests. Our foreign trade and our shipping are built up upon the solid foundations of our labour at home and the productive capacity of our economic system so vastly enhanced by that labour. Just as our trade and transportation grew with our productive capacity, so has the development of trade and transportation reacted in a stimulating and helpful manner upon our domestic productive capacity. And so the words of the Emperor, spoken twenty years ago, "The world is under the sign of trade", are not more true of any other country than of Germany.

But however firmly our foreign commerce is based upon our home labour, it has proved equally important and necessary to create for it permanent and well-anchored supports beyond our frontiers. The limitation of German territory and the restrictions imposed by our climatic conditions, in connection with the growth of our population and its increasing and more refined requirements, compel us to import enormous quantities of raw materials, food-stuffs, and luxuries, which we must pay for with our labour and particularly through

the export of our manufactured goods. These circumstances raise the problem of guaranteeing, so far as possible, our supply of the necessary raw materials from abroad, as well as the marketing of our manufactured products in foreign countries.

That problem lies partly in the domain of our economic policy, particularly our commercial policy.

The problem is to combine the preservation and encouragment of our productive forces at home with securing the most favourable and constant conditions possible for our foreign trade, especially for marketing our manufactures and procuring the necessary raw products.

The solution of that problem has been satisfactorily found in German commercial policy under the reign of our Emperor. This can be asserted without danger of serious contradiction, however far the views of interested circles and political parties may diverge precisely in matters of commercial policy. Agriculture and those sections of industry that need protection from foreign competition for the development of their productive powers have obtained that protection on a far-reaching scale and have strongly developed under it. At the same time we have succeeded, through the system of long-term commercial treaties, in keeping open foreign markets for the German exporting industries, and foreign seaports for German shipping, and in securing for the German merchant favourable conditions for carrying ou his trade abroad.

The way to that goal led not only through extremely difficult negotiations with foreign countries, but also through hard struggles at home, during which the

passions of supporters and opponents were often violently enflamed. It is an abiding merit of our Emperor, who was confronted from the first years of his reign with these questions, so important and so confused by sharply conflicting interests, that he fixed his eye upon the goal from the very beginning and has maintained with calm confidence the position once taken.

With the negotiation of treaties for securing the interests of our commerce and shipping, however, we have not been, and dare not be, satisfied to stop. Our dependence upon foreign countries, the counterpart to the great advantages derived by us from having taken our place in world-economy, calls for stronger counterpoises. Such a counterpoise can be created by German enterprise and German capital establishing a field for their activity beyond the borders of our country, and thereby gaining a direct influence over foreign territories that may be important to us as sources of supply and as markets. This can be done in an effectual way by acquiring over-sea colonial possessions; for in such case economic influence is secured and strengthened in the most effective manner possible by political domination. Insofar, however, as this way is limited or barred up altogether — for when Germany, after the restoration of its political power, first cast its eyes over the seas, it found unfortunately that the colonial world was already for the most part occupied — our end must be reached by means of a far-sighted financial and economic activity.

The policy of acquiring colonies had been inaugurated about the middle of the eighties of the past century within modest limits, but in a manner that

determined the subsequent development. Up to the time when our Emperor took over the government all that had been done was that a few mercantile undertakings had been established and the German flag unfurled at a few places on the African coasts and in the South Seas which were as yet without owners. The territorial expansion of Germany's colonial empire proceeding from these points of support, its extension by important new acquisitions, the geographical exploration, the military subjugation and the gradual consolidation into a well-ordered administration, the opening of the colonies for economic development and the work of civilisation, — all these achievements fall within the reign of our Emperor, for the most part within the past ten or fifteen years. These achievements are not slight. The natural difficulties of the regions which we were still able to secure at the eleventh hour, as it were, were enhanced by the resistance of the natives; the frightful sacrifices of blood and the large expenditures of money rendered necessary in suppressing the uprising in South-west Africa are remembered by everybody. In addition to the difficulties out there we had other difficulties at home: — lack of comprehension, despondency, scepticism, and as a result, a deficient spirit of sacrifice, deficient enterprise; finally, deficient experience, deficient organisation, and deficient tradition, with their natural result of business and administrative bungling.

These initial difficulties have now been substantially overcome.

Germany's colonial empire now embraces an area of 2 900 000 square-kilometers and is therefore about five times as large as the German Empire. The native population may be estimated at more than 11 000 000;

the white population exceeds 27 000, whereas it was not quite 10 000 ten years ago. In the African colonies at the end of 1912 there were 3,867 kilometers of railways in operation and 696 kilometers building. The aggregate trade of the colonies in Africa and the South Seas amounted in imports and exports to only 46 600 000 marks in the year 1898, but by 1912 it reached 263 000 000 marks. In a period of fourteen years, accordingly, this trade has increased more than five-fold. Besides this, the trade of Kiaochau rose from 34 500 000 marks in 1902 to 195 200 000 marks in 1911. The direct trade of Germany with its colonies, which in 1896 amounted to only 11 000 000 marks, now far exceeds 100 000 000 marks.

In spite of the above facts, however, the development of Germany's colonial empire remains today in its incipient stage. It must be left to the future to develop the very promising beginnings already made toward creating a colonial market for our manufactured goods and toward producing the raw materials — cotton growing especially may be mentioned — needed for our home industries; and to carry this development to a point where it shall influence our position in the world.

The manifestation of progress in the German colonies is only one chapter out of the general manifestation of German enterprise in foreign countries, and particularly over the seas. The motto of the German merchant is: "My field is the world." Long before the German Empire set about the acquisition of colonial possessions — nay, long before the existence of the Empire itself —, German merchants were to be found at all the important commercial centers in the European and the non-European world. Many have unfortu-

nately lost their nationality; but many others have maintained and cultivated their German spirit and their relations to the homeland; and they constitute a valuable element of Greater Germany. Their commercial, manufacturing, and agricultural undertakings, although rooted in a foreign soil, are an important support for Germany's position in the world's business. This is especially true of the works of civilisation on the grandest scale which German enterprise and German capital have created in the course of the past few decades in non-European countries: — the great electrical undertakings, irrigation systems, and especially railways, which — like the Bagdad Railway and the Shantung Railway — open up anew under German direction extensive regions and develop them into sources of supply for our import trade and into markets for our exports. The Emperor has ever shown a special good-will and given special encouragement to these great undertakings.

The powerful structure of interlocking and interdependent economic activities at home and abroad rests on a trustworthy basis only so long as it is protected against all possible violence. German economic life is conscious of being strong enough, in times of peaceful competiton, to maintain and strengthen its position. But the temptation for a strong nation to make use of its political and military resources against a weaker one in the struggle of economic competition has at all times been very great. The numerous wars over commerce in the history of the world give evidence of this. All the progress of culture and civilisation in the life of the nations must not deceive us and cause us to forget that any too-sharp divergence in the development of economic strength and political power creates a tendency

toward a violent explosion and a re-establishment of equilibrium. Knowing this, Germany — which is compelled by its geographical position and its experiences in history to maintain a land-army equal to all contingencies — had also to decide to protect its ever-growing and expanding economic relations over the seas by building a navy strong enough to nip in the bud any temptation, on the part of any enemy, to crush our economic competition by force. Our navy, the creation of our Emperor, is, in this sense, the keystone in the migthy system to which is due the extraordinary development or wealth in Germany, and which today constitutes the basis for the existence of the German people.

C. Consumption.

The final purpose of all creative economic work is the satisfaction of the material wants of humanity. The more intense and intelligent work, the whole enormous equipment of technique and organisation, which stimulated production and trade and transportation during the past twenty-five years to a so much higher degree than the mere growth of the population demanded, must find a counterpart in increased consumption, in an elevation of the standare of life, — or else we miss the real goal of all this working and producing.

But although the final purpose of economic labour is, to intensity in quantity and quality the satisfaction of our material wants, still this signifies by no means that an increase of the product of labour must find full expression in a corresponding increase of consumption.

In this matter it is with the whole population as it is with the individual: along with consumption there is saving. A large part of the product of the economic labour of the people is not, from its very nature, directly consumed in satisfying wants, but goes to increasing our producing power, with the indirect result of later stimulating consumption. All the increase, of wealth in Germany during the past twenty-five years caused by agricultural improvements (including the improvement and increase of livestock); by building factories, warehouses, and workshops of all sorts, railways, ships, harbours and other facilities and arrangements for promoting trade and transportation, and public buildings; by acquiring foreign securities and other forms of productive property, — represents that part of the product of labour in German economic life which was not found necessary for immediate consumption. The values thus described — as can be seen at a mere glance — are quite enormous. An estimate of them in figures will be attempted later, in treating the increase of the national wealth.

At this place the development of the consumption of a few important staple commodities for which statistical materials are at hand will be shown. In doing so we exclude articles like metals and fuels, which, from their very nature, are not used at all, or only slightly so, for the satisfaction of immediate wants, but find their application exclusively or chiefly in the further processes of production.

We begin with cereals (wheat and rye), which, indeed, are not used exclusively, but still to a very pre-eminent degree, directly as food for men.

Germany's consumption of rye and wheat.

Average in five-year periods	Rye		Wheat and Spelt		Both cereals	
	Total	per caput	Total	per caput	Total	per caput
	1000 tons	kilo	1000 tons	kilo	1000 tons	kilo
1886/90	5 519	114.5	3 063	63.6	8 582	178.1
1907/11	9 180	143.1	5 685	88.6	14 865	231.7
Increase, per cent.	66.3	24.9	85.6	39.3	73.2	30.1

The increase is considerable, and it remains noteworthy even if we take into account the fact that crop statistics prior to 1893 were taken by a less correct method than now, which failed to include about 15 per cent. of the yield. The results shown warrant the conclusion that there has been a considerable improvement in the nourishment of the population. The increase of consumption per caput of the population was greater than in other countries, as is shown by the following table:

Per Caput Consumption of Wheat and Rye.
(in kilogrammes).

	Germany	Austro-Hungary	United Kingdom	France	Italy	United States
1886/90	178.1	152.6	163.9	251.8	122.8	117.2
1902/06	247.6	174.0	166.2	241.6	145.0	143.5
Increase or decrease, per cent.	39.0	16.3	0	— 4.2	18.0	28.3

Germany has today, accordingly, the heaviest per caput consumption of cereals, whereas France had formerly occupied the first place.

The development of Germany's consumption of of barley, oats, and potatoes is shown in the next table:

Germany's Consumption of Barley, Oats, and Potatoes.

	Barley		Oats		Potatoes	
	Total 1000 tons	per caput kilo	Total 1000 tons	per caput kilo	Total 1000 tons	per caput kilo
1886/90	2369	53.3	4142	85.9	18567	385.2
1907/12	5836	90.8	7708	120.2	36990	577.2
Increase per cent.	146.3	70.4	86.1	39.9	99.2	49.8

In the case of these products, too, comparisons with other countries are almost without exception favourable to Germany.

The ascertainment of the consumption of meat presents very great difficulties. For Germany we have tolerably trustworthy data only since 1904 for making a statistical calculation; for the United Kingdom more precise materials are at hand for a longer period, but for other countries no adequate data can be obtained. The official statistics of slaughterings for the markets in 1912, in connection with the official inquiry regarding the number of slaughterings for household consumption in 1911 and 1912, give the following view of meat production in Germany:

Animals slaughtered	Slaughtered for market	Slaughtered for home consumption	Total slaughtered	Estimated weight (net average	Meat production	
					total	per caput
	1000 head	1000 head	1000 head	kilo	1000 tons	kilo
Oxen and bulls . .	944.9	159.9	—	320	934.21*)	14.13
Cows . . .	1 727.6		—	240		
Young cattle	961 5		—	185		
Calves . .	4 360.3	—	4 360.3	40	174.41	2.64
Sheep . .	2 263.4	509.8	2 773.2	22	61.01	0.92
Swine . .	18 196.3	5 780.9	23 977.2	85	2 038.06	30 83
Horses . .	179.0	—	179.0	235	42.07	0.63
Goats . . .	467.9	722.5	1 190.4	16	19.05	0.29
					Total,	49.44

Including the net imports of fresh and prepared meats, lard and animal fats — which, according to an investigation made by the Imperial Health Office in 1912, may be placed at 2,5 kilogrammes per caput of the population — the total average consumption of meat by the population of the Empire would be 51,9 kilogrammes per caput.

In the United Kingdom the consumption of meat has been ascertained to be as follows:

Consumption of meat in Great Britain and Ireland (in kilogrammes per caput of the population).

	Beef	Veal	Mutton	Pork	Total
1890	21.2	0.9	8.1	15.3	45.5
1904	24.6	1.0	9.9	17.1	52.6

*) The weight of cattle slaughtered for household consumption has been assumed as 245 kilogrammes, or the average weight of oxen, bulls, cows, and young cattle slanghtered for market.

Germany's consumption of meat per caput was accordingly about as great in 1912 as that of England in the year 1904, — and the English consumption is regarded as the largest among all European countries.

In the case of alcoholic beverages no substantial increase in the per caput consumption is to be noted. The consumption of brandy increased from 4.4 to 5.3 liters in the period from 1887—88 till 1911—12, that of beer from 98 to 99 liters in 1910—11, and to 106 in 1911—12, — which latter year included the unusually hot summer of 1911.

The consumption of tobacco, too, has remained quite unchanged; the average for the five years 1907—11 was 1.5 kiligramme per caput, or exactly the average for the five years 1886—90.

The consumption of table and cooking salt showed very slight changes; it varies between 7.5 and 8 kilogrammes per caput.

The consumption of sugar showed a different picture. According to the official returns the average consumption of raw sugar was as follow:

1887—88:
398 000 tons, or 8.4 kilo. per caput of the population
1901—02:
669 000 „ „ 11.6 „ „ „ „ „ „
1910—11:
1 242 000 „ „ 19.0 „ „ „ „ „ „ *)

In spite of this considerable increase, and notwithstanding the fact that Germany is the foremost sugar-producing country in the world, our consumption is even yet considerably less than that of England and

*) 1911/12 1 112 000 kilo, or 16.9 kilo per caput. Compare note p. —.

the United States, whereas it has almost reached that of France.

Per Caput Consumption of Raw Sugar

(in kilogrammes).

	Germany	Austro-Hungary	United Kingdom	France	Russia	United States
1885/86	6.8	5.1	31.9	11.8	3.7	22.4
1910/11	19.0	13.0	41.1	19.3	10.1	35.9

In exotic groceries and tropical products there was in almost all cases a substantial increase of consumption, as shown in the following table:

	Coffee		Cocoa beans		Tea		Rice	
	Total tons	per caput kilo	Total tons	per caput kilo	Total tons	per caput kilo	Total tons	per caput kilo
1886/90	114263	2.38	4954	0.16	1912	0.04	84375	1.76
1911	181681	2.79	55100**)	0.83	3793	0.66	176553	2.71

There was also a considerable increase of consumption in the most important raw material of the clothing trades, — namely, cotton. The average annual consumption of cotton in Germany during the years 1886—90 was 201 000 tons, or 4.19 kilogrammes per caput of the population. In the year 1911—12, on the other hand, it was 393 000 tons, or 5.93 kilogrammes per caput.

All these data represent average numbers. It is evident, however, that they are an expression of a

**) 1912.

general tendency which cannot be greatly influenced by variations affecting only a small part of the population. The fact is accordingly beyond all doubt that a great improvement, both as to quantity and quality, in the nourishment and — as the substantial increase in the consumption of cotton shows — also in the clothing of the great masses of the population has taken place during the past twenty-five years.'

CHAPTER III.

Aggregate Income and National Wealth.

So far as specific figures were given on the preceding pages, they referred to the development of single branches of the country's production, to the increase of trade and transportation, to the consumption of single important commodities.

Those figures show, almost without any exception, a powerful advance in our economic conditions; they unite to form a living and most gratifying picture of the robust, upward-striving power and development of our people.

The desire to bring together the manifold elements of that picture into a total impression is a natural one. We are accustomed, in the management of business undertakings, to strike a comparison between the debit and the credit side of accounts, between payments received and payments made, and from the total sums thus ascertained to determine the state of the property and draw conclusions as to the business success or decline of the undertaking. Would it not be possible to apply the same method to economic life in its entirety?

There has been no lack of efforts of this kind; but none of them led to satisfactory and indubitable

results: for, notwithstanding the great progress in economic statistics, the presuppositions for drawing a correct and complete balance are lacking: we have no exact inventory and no bookkeeping for the economic life of the nation as a whole. Consequently comprehensive estimates must take the place of exact numerical statements; in place of a precise ascertainment of values calculations based on more or less uncertain data must be made. Consequently again we shall have to fill out large gaps at a venture; and thus we shall get results showing only approximate values, having wide margins of error. And yet the effort is worth the labour of trying to estimate, at least approximately, the compass and development of the wealth of our people: for total numbers, even where they are only approximations, give, — at least for purposes of comparison with what formely was, or with what now is somewhere else — a more striking picture than any long series of statements, however exact.

A. Aggregate Income of the German People.

A comparatively trustworthy basis for estimating the total income of our people is supplied by the income-tax returns. These are made up, indeed, according to different systems in the various German states; hence they cannot be compared in a mere mechanical way, or simply added together to obtain a total result. In some of the Federated States there is no system of taxation at all that warrants specific conclusions about incomes. Everywhere, too, the reservation must be made that not even the most stringent provisions of law can always insure correct and complete assess-

ments, but that not inconsiderable parts of the incomes of the people escape taxation, — and that quite apart from the fact that there is a minimum income exempt from taxation, which everywhere leaves a considerable part of the population out of the assessment altogether.

Fortunately there has existed for two decades in the largest State, whose population comprises nearly three-fifths of the population of the Empire, an income-tax and assessment system which warrants tolerably trustworthy conclusions as to incomes and their development.

In the tabular view (given on pages 96, 97) the results of the income-tax assessment in Prussia have been supplemented at a few points with estimates. In the first place, an average income of 1500 marks has been assumed for certain persons with incomes ranging between 900 and 3000 marks, and for certain reasons exempted by the income-tax law; and, in the second place, an average of 750 marks has been assumed for persons with incomes below 900 marks, where the tax begins. The incomes of impersonal tax-payers has not been included, since these re-appear as personal income.

In order to give at once a view not only of present conditions, but also of previous development, we have compared the results for 1912 with those for 1896, 1901, 1906, and 1911. It would not be practicable to go further back than 1896, inasmuch as the income-tax system, which was only put into operation in 1892, required some time for establishing an adequate regularity in the assessment.

The result of the assessment for 1912 showed aggregate taxable incomes of 15 240 000 000 marks, as

Representation objects	In the years				
	1896	1901	1906	1911	1912
1. Total incomes of tax-payers with incomes more than 3000 marks	3371813202	4709360988	5621232580	7491937371	?
Legal deductions allowed for these tax-payers	482498767	661203935	840544486	1083123199	?
There remains as taxable incomes of these tax-payers	2889314435	4048157053	4780688094	6408814172	6656200000
2. Taxable incomes of tax-payers with incomes between 900 and 3000 marks, calculated from arithmetical average of the taxes paid by the various classes within this group	3196738200	4327900725	5551113675	8078444550	8583570000

3. Incomes of persons exempted under paragraphs 19 and 20 (formerly 18 and 19) of the income-tax law, assuming a minimum average income of 1500 marks.*)	308713500	428730000	509683500	953611500	952786000
4. Incomes of tax-free individuals and heads of house-holds, assuming a minimum average income of 750 marks.*) .	6460495500	6542760910	6626449500	6188780250	6119193000
5. Total income of personal tax-payers and persons exempt . . .	12855261635	15347548688	17467934769	21629650472	22311749000

*) It should be remarked that the memorandum accompanying and explaining the bill regarding changes in the financial system (Vol. III, "Materialien zur Beurteilung der Volkswohlstandsentwicklung Deutschlands im letzten Menschenalter", page 14), assumed 900 and 450 marks as the average minimum incomes under numbers 3 and 4.

compared with 14 487 000 000 marks ascertained in the assessment of 1911. If we assume that the incomes of persons exempted from the tax and those with incomes below the tax-limit (Nos. 3 and 4 in the table on pages 96 and 97) amounted to about 7 070 000 000 marks, as against 7 142 000 000 marks for 1911, we get an aggregate personal income of 22 310 000 000 marks for Prussia.

In order to arrive at the closest possible approximation to the actual income, certain additions must be made to the figures given in the table.

A considerable addition, estimated by most authorities at about 10 per cent., must be made for income which, though taxable, escapes assessment. The total assessment of 15 240 000 000 marks for 1912 would therefore have to be raised by 1 524 000 000 marks.

Furthermore, a part of the incomes of impersonal tax-payers must be included; for only the dividends actually paid re-appear as personal income, whereas quite substantial parts of the business profits of companies are retained by them in the form of reserves of various kinds. As no well managed company will even remotely content itself with setting aside merely the reserves required by law, it would not seem too high to add to the general result one-fourth of the income assessed for impersonal tax-payers. This would give, upon a basis of 890 000 000 marks impersonal assessments for 1912, a further addition of 220 000 000 marks.

Taking account of these additions, therefore, we should get an aggregate income for Prussia alone of about 24 000 000 000 marks. For a population of somewhat more than 40 000 000 this would give an average

income of nearly 600 marks per caput. A thorough examination of the assessment results in the other states having an income-tax system suitable for purposes of comparison, shows that this average may be taken as representing approximately the average income for the whole Empire. In Saxony the average is rather higher, in Württemberg and Baden somewhat lower, in the Hansa cities — with an average of nearly 1000 marks — considerably higher, and in the relatively poor Thuringian states considerably lower.

If we apply the Prussian average to the whole Empire, with its population of about 66 000 000, we get a grand total of private incomes of 39 000 000 000 to 40 000 000 000 marks. To the private incomes, however, must be added those of the public corporations, especially the revenues of the large Federated States and the Empire from such sources, — after deducting, of course, payments for personal services, materials, etc. Payments for materials, however, should be deducted only insofar as these are not used for making permanent improvements in the property of such undertakings. The addition of at least 1 000 000 000 marks appears justified.

Germany's total annual income would accordingly amount at present to somewhat more than 40 000 000 000 marks.

A similar calculation for the year 1896 would yield an aggregate income of about 21 500 000 000 marks (about 410 marks per caput).

The increase of the aggregate income during the past 16 years would therefore amount to about 80 per cent, and the increase of the average per caput income to about 45 per cent. The moderate character of the

estimate here made in seen when we compare it with other estimates. Thus Prof. Schmoller reckoned the aggregate income for the year 1895 at 25 000 000 000 marks (instead of the 21 500 000 000 marks yielded by the above method of calculation), which would give, upon the basis of the rate of increase ascertained above, about 45 000 000 000 marks as the aggregate income for 1911.

The estimate of Steinmann-Bucher, who calculated for the year 1908 an income of 35 000 000 000 marks "as the minimum limit of probabilities", agrees substantially with the estimate here made.

For foreign countries we possess but scanty materials for making a comparison with Germany.

The income of the French people was estimated a number of years ago by Leroy-Beaulieu at 25 000 000 000 francs. As this was at a time when the income of the German people had already reached about 35 000 000 000 marks, it is evident that France is considerably behind Germany in national income. Of course, the difference is smaller when we consider the average per caput income. If we take the year 1908 as normal, the average income of the German people for that year would be 555 marks, as compared with 514 marks for the French people. This result, which may be surprising in view of the widespread opinions about the wealth of France, does not appear improbable when we consider the matter closely. As to the French people being superior to us in wealth per head this is undoubtedly counterbalanced to a great extent by the fact that we work with very much greater intensity in Germany than they do in France. France is the land of rents, Germany the land of labour.

The English national income was also estimated several years ago by Chiozza Money at £ 1 710 000 000, or about 35 000 000 000 marks, which was, according to our calculations, exactly the same as the income of the German people at that time. This sum would give an average per caput income of 815 marks for England, as compared with 555 marks for Germany.

The distribution of the national income among the different income-classes and the development of this distribution are of especial interest.

The following table shows the distribution for Prussia, as found at the varions assessments (pages 102).

The table shows the following changes from 1896 to 1912:

1. The number of persons with incomes up to 900 marks decreased from 8 614 000 to 8 159 000. On the other hand, the number of tax-payers with incomes above 900 marks rose from 2 859 000 to 7 542 000. The number of persons exempt from the tax, including their dependents, fell from 21 066 000 to 16 005 000; but the number of tax-payers, including their dependents, increased from 10 283 000 to 24 232 000. A large part of the population, accordingly, have passed above the income-limit of 900 marks within these fifteen years. Whereas more than two-thirds of the population were still exempt from the tax in 1896 because their income did not reach the minimum tax-limit, not quite two-fifths of them were exempt for this reason in 1912.

2. The number of tax-payers and their total income showed the greatest increase — about two-and-one-half-fold — in the income-groups from 900 to 3000 marks and from 3000 to 6000 marks, with the exception of incomes above 100 000 marks, where special circum-

Movement of Personal Income's in Prussia.

	1896	1901	1906	1911	1912
Population (1000 persons	31 349	34 056	36 839	39 773	40 237
Number of persons exempt (incomes up to 900 marks) —					
including dependents } (1000 persons) . . .	21 066	20 590	20 297	16 383	16 005
excluding do } (1000 persons) . . .	8 614	8 724	8 835	8 253	8 159
Number of taxable personal incomes (over 900 marks) —					
including dependents } (1000 persons) . . .	10 283	13 466	16 533	23 390	24 232
excluding do } (1000 persons) . . .	2 859	3 933	5 013	7 192	7 542
Personal tax-payers, with incomes of —					
900—3000 marks (1000 persons) . . .	2 321	3 211	4 146	5 806	6 123
Incomes (million marks) . .	3 197	4 328	5 551	8 078	8 584
3000—6000 marks (1000 persons) . .	215	281	343	522	548
Incomes (million marks) . .	874	1 136	1 385	2 044	2 144
6000—9500 marks (1000 persons) . .	57.5	75.2	89.4	106.3	111.5
Incomes (million marks) . .	427	559	664	792	832
9500—30 000 marks (1000 persons) . .	47.3	63.9	74.8	93.7	99
Incomes (million marks) . .	727	990	1 156	1 449	1 534
30000—100000 marks (1000 persons) .	9.3	13.4	15.8	19.4	21
Incomes (million marks) . .	462	670	784	972	1 052
more than 100000 marks (1000 persons) .	1.7	2.8	3.2	4.1	4.5
Incomes (million marks) . .	399	694	792	1018	1 094

stances prevail. In these two groups together the increase of income since 1896 was about 6 800 000 000 marks, whereas the aggregate increase of taxable income was 9 000 000 000 marks.

3. The increase of tax-payers and income in the group from 6000 to 9500 marks was somewhat less; but here, too, the figures were nearly doubled (exact gains: 94 per cent. for tax-payers, and 95 per cent. for income).

4. In the next groups, from 9500 to 100 000 marks, the increase was somewhat more than 100 per cent.

5. In the group of incomes above 100 000 marks the percentage of increase in the number of tax-payers and in income was about as great — namely, about 150 per cent. — as in the groups from 900 to 6000 marks. This heavy increase, however, cannot be compared with that of the other groups without a certain reservation; for in those groups the accessions of tax-payers from the next lower group were partly counterbalanced by losses to the next higher one, whereas this was naturally impossible with the highest group of all.

The total result was accordingly a general shifting of incomes upwards; and this movement was especially heavy from the tax-free class into the income-groups from 900 to 6000 marks. The "plutocratic development", so often asserted, therefore does not exist.

That the large increase of incomes precisely in the lower tax-groups was not a mere apparent one, due to a more rigorous assessment, but a real fact, can be proved especially by the development of wages.

As an example we may take the wages of miners. The average net wages of coal miners per annum amounted —

In the year	in the Government Mine Inspecting Districts of —	
	Dortmund	Upper Silesia
1888 to	863 marks	516 marks
1912 to	1586 „	1053 „

It must also be taken into consideration here that these sums represent net wages, after deduction of contributions to the various branches of labour insurance, which has been greatly expanded within the past twenty-five years. The average payments for the different forms of insurance amounted in 1912 to 204 marks per caput in the Rhenish-Westphalian district.

The increase of wage-incomes in Germany becomes more striking through a comparison with England.

The average yearly earnings of the English coal miner in 1900 amounted to 1 732 marks, against 1 332 marks for the German miner in the Ruhr (Essen) district. In the year 1912, on the other hand, the English average was 1622 marks, and the German 1586 marks. Besides this, the German figures here given represent net earnings; whereas the British miner has to pay out of his earnings all the contributions to various forms of insurance, except 20 marks a year per caput which the employers must pay as their average contribution for accident insurance. If we add these 20 marks to the earnings of the British miner, and the 204 marks mentioned above as insurance contributions, to the earnings of the German miner, we get an average wage of 1642 marks for the English miner in 1912, but 1790 marks for the German miner in the Ruhr district. The difference in favour of the German

miner in 1912 was therefore about 148 marks, whereas it had been in 1900 — also after taking into account the insurance contributions of that time — 278 marks in favour of the British miner.

This development, of course, is not confined to coal mining; it reappears in the other branches of production in a similar, though not everywhere in an equally pronounced form.

If now the present yearly income of the German people be placed at 40 000 000 000 marks, this sum would, of course, mean the gross result of Germany's economic activity. The largest part of this gross amount is consumed in the course of the same year, chiefly in the maintenance of private families, but also for meeting the not inconsiderable expenditures of public corporations. For these latter a correct estimate can be obtained by examining the budgets of the Empire, the Federated States, and the municipalities and provinces. Such an estimate, however, is not possible for private consumption. In order to ascertain the annual surplus product of German economy over consumption, therefore, we are compelled to resort to the indirect method of calculating the annual increase of the national wealth.

B. The national Wealth of Germany.

The difficulties in the way of making an approximately accurate estimate of national wealth are considerably greater even than those that are to be overcome in estimating the yearly income of the people.

Of course, there exists a property tax in a few of the Federated States, especially in Prussia, in addition

to the income-tax. But the method of assessing it is much inferior to that applied to the income-tax, inasmuch as there is, in most cases, no obligation to make a declaration. It is evident, therefore, that the margins of error are rather wide in the case of an estimate of the national wealth based upon the results of the property-tax assessment. The statistics of real and personal property insured against fire, however, supply the means for testing the correctness of our work.

The assessment of the supplementary (property) tax in Prussia gave the following results:

Taxable Property in the years		Increase	
		total	per annum
	Marks	Marks	Marks
1896	63 578 000 000		
1899	70 042 000 000	6 464 000 000	2 155 000 000
1902	75 651 000 000	5 609 000 000	1 536 000 000
1905	82 410 000 000	6 759 000 000	2 253 000 000
1908	91 653 000 000	9 243 000 000	3 081 000 000
1911	104 057 000 000	12 404 000 000	4 468 000 000

In the year 1911, as we see, the taxable property of Prussia was ascertained to be about 104 000 000 000 marks.

Certain additions must be made to this sum, just as with assessed incomes.

1. An addition must be made at the start for property that is taxable, but is not embraced in the assessment. If we assume 20 per cent. for this addition, as against 10 per cent. with incomes, it would not appear excessive, — all the more as there is no obligation to make a declaration for the property tax; and landed

estates devoted to agriculture or forestry, which — contrary to the practice with other forms of property — are to be returned, not at their actual market value, but at a value estimated from their net yield, undoubtedly appear on the assessment rolls at figures which are, upon the whole, below their market value.

2. A further addition is necessary for private property legally exempt. All properties less than 6000 marks are tax-free, and so are those between 6000 and 20 000 marks when the owner's income is less than 900 marks.

The number of owners with less than 6000 marks was ascertained in 1911 to be about 5 400 000 and those with tax free property between 6000 and 20 000 marks 240 000. If we assume for the former group an average of only 2500 marks and for the latter only 8000 marks, we obtain a further addition of 15 500 000 000 marks.

3. Furthermore, furniture, household utensils, clothing, ornaments, works of art, and other movable articles not forming a part of capital investment or productive plants are not subject to the property-tax. The total for them would certainly not be over-estimated if we assume a 10 per cent. addition to assessed property, inclusive of the two additions under 1 and 2, which means another 15 000 000 marks or 375 marks per caput in Prussia.

Assessed property, with these various additions to it, amounts therefore to 155 000 000 000 marks. But it is manifestly proper to add a still further amount to cover such property of impersonal owners as is not fully included in the returns of the private persons who participate in its ownership. Hence the total amount of private property in Prussia would be 160 000 000 000

marks. This would yield an average of 4000 marks private property per caput in Prussia. Assuming a like basis for the Empire we get a total of about 260 000 000 000 marks for the private property of the German people.

To this must still be added the large property of puplic corporations.

The capital invested in state railways alone amounts, on the books, to more than 17 000 000 000 marks. This nominal value, however, is considerably less, not only than the capital actually invested, but than the actual present value. Several years ago the Prussian Finance Minister, von Rheinbaben, estimated the value of the Prussian-Hessian railways at 19 000 000 000 marks. For all the railways of Germany an addition of 20 000 000 000 to 25 000 000 000 marks would appear very moderate.

A further sum must be added for the property of states and municipalities invested in profit-earning undertakings other than railways: namely, public domains and forests, mining property, harbour works, canals and river improvements, investments in post-office and telegraph systems, the property of the Reichsbank, the state banks and private banks of issue, street railways, gas and electrical works, slaughtering-houses and cattle-yards, also the property of public insurance institutions, which in 1911 amounted to 2 500 000 000 marks; finally also unproductive property, like school houses, the buildings and other property of religious bodies, museums and collections, court and administrative buildings, public parks and grounds, and, last not least, the entire property of army and navy. A further amount of 25 000 000 000 to 30 000 000 000 marks would represent the minimum estimate for all these purposes.

The total assets of the Empire, the states, and the communal organisations would therefore amount to about 50 000 000 000 marks. This total, however, must be reduced by the amount of the public debts, which is about 25 000 000 000 marks; this would leave an active balance of 25 000 000 000 marks.

Adding this public property to the 260 000 000 000 marks private property already ascertained, we obtain a grand total of 285 000 000 000 marks as the aggregate wealth of the German people.

Testing this result with the fire-insurance statistics, we find that it is rather too low than too high. The insurance of real and personal property against fire has shown the following development in Germany:

Insured Values (in million marks).

	In public institutions	in joint-stock companies	in mutual associations	Total	Increase	
					total	per annum
1896	42 900	63 040	11 360	117 300	—	—
1902	54 065	80 657	12 290	148 012	30 712	5119
1905	61 160	93 245	14 585	168 990	20 978	6993
1908	69 479	108 813	16 070	194 361	25 371	8457
1911	79 368	123 623	18 007	220 998	26 637	8879

These figures include also the foreign insurance of German insurance companies, which can be estimated for recent years at 20 000 000 000 marks. On the other hand, they do not include the insurance of German property in foreign companies, the amount of which cannot be ascertained. In any case, the aggregate value

of real and personal property in Germany itself insured against fire in home and foreign companies can be placed at 200 000 000 000 marks as a minimum. This allows nothing for property insufficiently insured, or not insured at all.

This total of 200 000 000 000 marks does not include the value of lands in city and country; for fire insurance covers, besides personal property, only the buildings erected on land, but not the land itself.

Owing to the great diversity in the prices of land in cities we have no adequate basis for forming an estimate of its aggregate value for all Germany. The estimates already made show great divergences, ranging between 20 000 000 000 and 50 000 000 000 marks. The latter estimate is that of Steinmann-Bucher, who assumes for the municipality of Berlin alone a total land value of 7 to 8 000 000 000 marks. Of the total area of Berlin, which is 6,350 hectares, 2,574 hectares are taken up by streets, railways, public parks, water areas, etc., which cannot be included in an estimate of land values. The land occupied by buildings or available for this purpose amounts to 3,776 hectares; and in order to reach a total value of 7 to 8 000 000 000 marks for this area, we should have to assume an average price per hectare of more than 2 000 000 marks or 3 000 marks per square rod. This would undoubtedly be too high, although very much higher prices are paid in the central parts of the city, especially on the best streets. In order to keep within safe limits we assume an average of 1 600 to 2 000 marks the square rod for the net area of the city available for building. Moreover, if we accept the ratio between the value of land in residence sections of Berlin and municipal land values for the other cities

of the Empire, as assumed by Steinmann-Bucher, we obtain a total for the latter of about 30 000 000 000 marks (instead of 50 000 000 000 marks).

The area of Germany devoted to agriculture and forests is 50 000 000 hectares. Of this about 26 400 000 hectares are given up to fields, gardens, and vineyards; about 6 000 000 to meadows; 2 700 000 to pastures; and about 14 000 000 to forests. In view of this distribution it would not seem excessive to assume an average value of 800 marks per hectare for all land used for agriculture and forests, inclusive of all improvements not insured against fire. An addition of 40 000 000 000 marks to the total national wealth to represent these land values would therefore have to be made.

We must next take into account the public and private mining property of the country, since only the buildings and equipment above ground are insured against fire. Following other estimates, we may assume a total vale of 5 to 6 000 000 000 marks.

Vessels employed in internal and sea-going commerce, which are not covered by fire-insurance, exceed 1 000 000 000 marks in value; and the goods in transit on them at home and on the high seas would also be valued low if we assume another 1 000 000 000 marks. The metallic money in circulation must also be taken account of here; 4 000 000 000 marks would be a low estimate.

Above all, however, the property of the state railways is not embraced in the property insured against fire; their value was estimated above at 20 to 25 000 000 000 marks. The same remark is true of harbour works at seaports and on internal waterways, and of certain other parts of the public wealth, like

post-office and telegraph facilities, and public buildings. We assume 10 000 000 000 marks for this group of values.

Finally, there remain to be mentioned the various forms of German capital investment abroad, including foreign government bonds, stocks and obligations of foreign companies, claims against foreigners, and agricultural, industrial, commercial undertakings conducted abroad by Germans.

If estimates are uncertain anywhere it is here. All estimates at hand are to be accepted with the greatest reserve.

German capital investments in over-sea countries were estimated, in a report published by the Imperial Marine Office in 1905, at 8 to 9 000 000 000 marks. The German holdings of foreign securities were placed by Prof. Schmoller in the year 1892 at 10 000 000 000 marks; a year later by Dr. Koch, then President of the Reichsbank, at 12 000 000 000 marks; and the report of the Marine Office expressed the view in 1905 that our holdings of foreign securities were "rather considerably above than under 16 000 000 000 marks". Now, it will not do simply to add our over-sea capital investments to our holdings of foreign securities, as is sometimes done; this would give a total, for the two groups of the Imperial Marine Office in 1905, of 24 to 25 000 000 000 marks. On the contrary, a large part, — in fact, by far the largest part, of our "over-sea capital investments" are in the form of securities. Upon the basis of the Marine Office's figures, therefore, our total investments of capital abroad in 1905 ought not to be placed higher than 20 000 000 000 marks. Even this total appears doubtful; for, from the total amount of foreign securities brought out in Germany, considerable reductions must be made to represent securities redeemed

or bought back by foreign countries. Especially within the past few years have new investments abroad been considerably restricted owing to the enormous home demand for capital for industrial and public purposes. In consideration of all the circumstances even the estimate of 20 000 000 000 marks for all Germany's investments of capital abroad seems rather too high than too low. As there is, however, an adequate margin of safety in the other items enumerated, we still assume 20 000 000 000 marks for this one.

Bringing together the various categories of public wealth, we get the following table:

Real and personal property insured against fire	200	milliard marks
Land in country and city	70	„
Mining property	5—6	„
Shipping, goods in transit, and metallic money	6	„
Public property, including railways, not insured against fire .	30	„
Capital investments abroad	20	„
Total	331 to 332	milliard marks

While the method first applied, based chiefly upon the assessment of the property-tax, yielded a total of about 285 000 000 000 marks for the national wealth of Germany, the second method, which uses mainly the fire-insurance statistics, gives a total value of 330 milliard marks.

We may assume that the actual value of Germany's national wealth lies between these two limits, say, not far from 300 000 000 000 marks.

Prof. von Schmoller estimated our national wealth for the year 1895 at 200 000 000 000 marks. A number

of other estimates made since then and even within the past few years have reached the same total. Since 1895, however, the property assessed in Prussia for the property-tax has increased in value from 63 578 000 000 marks to 104 057 000 000 marks, — that is to say, by 65 per cent; and the real and personal property insured against fire in the German Empire has even increased in value from 117 300 000 000 to marks to 210 400 000 000 marks, or nearly 80 per cent. If we assume that one-fourth of these increases was due to a more rigid assessment and to the more complete insurance of property, we should obtain a net increase of the national wealth by 50 to 60 per cent, from 1895-96 to 1910-11. Upon the basis of 200 000 000 000 marks national wealth for 1895 there would therefore result a total of 300 to 320 000 000 000 marks for 1910-11. This result tallies well with the totals, estimated above by two different methods, of 290 to 330 000 000 000 marks. On the other hand, Steinmann-Bucher's estimate of 350 000 000 000 marks for the year 1908 appears somewhat too high.

Our estimate of the German national wealth at 290 to 320 000 000 000 gives an average per caput wealth of 4 600 to 4 909 marks for the population of the country.

The latest systematic estimate for France (that of Edmond Théry) gave a total of 287 000 000 000 francs (232 500 000 000 marks) for the year 1908, as compared with 243 000 000 000 francs (200 800 000 000 marks) for the year 1892. The average property per caput of the French people would therefore be 7 314 francs (5 924 marks) for 1908. Germany has therefore considerably out-distanced France since the nineties as regards the total sum of the national wealth. On the other hand, France is still in advance of us in per caput wealth.

For England the estimates run between 230 and 260 000 000 000 marks (5 100 to 5 800 marks per caput). For the United States the Census Office estimates the national wealth at about 500 000 000 000 marks (5 500 marks per caput).

According to these estimates Germany would even today be still behind France, England, and the United States in average wealth per caput. On the other hand, Germany would be in advance of France and England by one-fifth to one-fourth in point of the total national wealth, whereas it would be out-stripped by the United States by more than one-half.

Inasmuch as the estimates for the foreign countries, however, are made upon even less trustworthy data, if possible, than those for Germany, these comparisons must also be treated with the greatest possible reserve.

C. The Yearly Increase of National Wealth in Germany.

The yearly gross profits of the economic activity of the German people at present were estimated above at 40 000 000 000 marks. This gross income is, to a great but not yet determined extent, used up in the course of the year. The surplus that remains is added as net profits — or, if anyone prefers, as "savings" — to the national wealth.

A not inconsiderable part of the consumption falls to the Empire, the Federated States, and other public bodies. The ordinary expenditures of the Empire may be placed at present at about 3 000 000 000 marks, and those of all the states at 5 800 000 000 marks, or a total of 8 800 000 000 marks. About 3 600 000 000 of these expenditures are made for the railways and other

business undertakings of the Empire and the federal States, which do not count here; hence the sum of 5200000000 marks remains as the actual consumption for public purposes. The extraordinary expenditures of the Empire and the individual states must be left out of account inasmuch as these go, for the most part, toward augmenting the national wealth and cannot be treated as consumed in the usual sense. To the state expenditures must be added those of the municipalities and other public organisations, which would hardly be over-estimated at 2000000000 marks. The total public consumption would accordingly amount to somewhat more than 7000000000 marks, or about one-sixth of the yearly income of the people. In this total are not included the contributions for labour insurance — now exceeding 1000000000 marks a year, or more than the total ordinary expenditures for army and navy — for the reason that these contributions are partly added to he capital accumulations of the insurance institutions, and partly reappear as income in cases where persons receive pensions or aid from them. Only the costs of administration, about 80000000 marks a year, should be reckoned as a part of the public consumption.

The personal consumption cannot be ascertained statistically, but we have certain data for reckoning the amount not expended and hence added to the national wealth.

The increment of the national wealth appears in direct form in the statistics of new issues of securities, and of bank deposits, including savings-banks and co-operative societies.

The following table shows the issues of stock-exchange securities in the German market during the past quarter of a century:

Securities Issued in Germany.

(market value, in 1 000 000 marks.)

Years	Public Credit			Land Credit Obligations
	State loans	Municipal loans	Total	
1886—1890	1 508	274	1 782	1 248
1891—1895	1 356	409	1 765	2 189
1896—1900	838	841	1 679	1 879
1901—1905	2 125	1 195	3 320	2 262
1906—1910	4 131	1 942	6 073	2 588
1911	242	309	551	650
1912	642	366	1 008	309

Years	Industrial and Commercial Credit			
	Industrial bonds	Industrial stocks	Bank stocks	Total
1886—1890	146	800	329	1 275
1891—1895	202	372	257	831
1896—1900	497	2 495	1 303	4 295
1901—1905	642	1 456	561	2 659
1906—1910	1 080	2 921	858	4 859
1911	294	536	177	1 007
1912	388	906	140	1 434

Years	Total home securities	Total foreign securities	Grand total	Yearly average
1886—1890	4 360	2 322	6 682	1 336
1891—1895	4 833	1 462	6 295	1 259
1896—1900	8 216	2 420	10 636	2 127
1901—1905	8 339	2 147	10 486	2 097
1906—1910	12 615	1 497	14 112	2 822
1911	2 249	460	2 709	2 709
1912	2 751	270	3 021	3 021

The increase of new stock-exchange securities during the twenty-seven years since 1886 has accordingly been about 53 to 54 000 000 000 marks, or a yearly average of almost exactly 2 000 000 000 marks. For the last seven years the increase choms a sparly average of nearly 3 000 000 000 marks. The yearly accretions, however, do not consist wholly of nowly created wealth; among the new securities there are many that result from the mere conversion of existing private undertakings into joint-stock companies. From the accretions considerable deductions are to be made, too, partly in consequence of redemptions and liquidations, partly owing to sales to foreign countries. On the other hand, there has been a heavy increase of investments in securities on foreign markets and in home securities not listed on the German exchanges; and it is equally certain that the rise in the quotations of many industrial and commercial shares has much more than counterbalanced the fall in interest-bearing paper. Upon the whole therefore the statistics of our new issues may be accepted as approximately correct.

The deposits of the German credit banks increased from 1895 to 1912 more than 7 500 000 000 marks, having risen from 1 770 000 000 to 9 360 000 000 marks. The yearly average gain was therefore about 460 000 000 marks.

The German savings-banks increased their deposits from 6 800 000 000 marks in 1895 to 8 800 000 000 marks in 1900, and to 17 800 000 000 marks in the year 1911. This gives a total increase of 11 000 000 000 marks from 1895 to 1911, or an average of 690 000 000 marks a year. The assets of the labour insurance institutions have a yearly gain of at least 500 000 000 marks. The sum

thus resulting for new issues of securities, bank and savings-bank deposits, and the increase of labour insurance assets, amounts alone to 4 500 000 000 marks.

It is clear that this number cannot remotely represent the annual increase in the wealth of the people; for only a part of the new capital annually created goes into listed securities, or is deposited in banks and savings-banks. Another part, of uncertain and scarcely ascertainable proportions, is added aut of surplus earnings to the working capital of private undertakings in all branches of production without coming within the purview of the statistician; or it goes to increase power of consumption of private individuals and households, amounts — which are becoming larger and larger, in keeping with the growing well being and more refined culture, with the increasing demands for sterling quality in goods, for comfort and luxury. Inasmuch, however, as data for estimating this part of the increment of the national wealth are wholly lacking, we have no other recourse — if we seek to reach an approximate idea of the total increase — than to revert to the figures already given, showing the development of the national wealth during the last few decades.

According to our calculations the property assessed for the property-tax in Prussia at present (104 000 000 000 marks) represents about one-third, and the amount of fire insurance in the German Empire (221 000 000 000) about two-thirds of the total wealth of the German people. If we apply this ratio to the increase of property assessments in Prussia and of property covered by fire insurance in Germany, and if we deduct in each case one-fourth of the increase as due to a more rigorous assessment or a completer insurance against fire, we

reach the following conclusions regarding the growth of the entire national wealth of Germany:

1. Upon the basis of the assessment of the property-tax.

From 1896 to 1911 the assessed property increased from 63 600 000 000 to 104 000 000 000 marks, or about 40 000 000 000 marks. The increase of the total wealth of the German people would be, according to the ratio just assumed, three times as great, subject to a reduction of 25 per cent, or 90 000 000 000 marks (40×3=120 —30=90) for the 15 years. From this we get an annual average increase of 6 000 000 000 marks. The increase, reckoned in three-year periods was of varying proportions for the different periods; it was as follows, (in 1 000 000 000 marks):

	Yearly Increase	
	of assessed property	of the total national wealth
Yearly average for 1896—1899	2 155	6.4—25% = 4.8
„ „ „ 1899—1902	1 536	4.6—25% = 3.6
„ „ „ 1902—1905	2 253	6.7—25% = 5.0
„ „ „ 1905—1908	3 081	9.2—25% = 6.9
„ „ „ 1908—1911	4 468	13.4—25% = 10.0

2. Upon the basis of property insured against fire.

The increase of values in this case was from 117 300 000 000 marks in 1896 to 221 000 000 000 marks in 1911, or about 104 000 000 000 marks. According to this the increase of the national wealth would be 117 000 000 000 marks ($^3/_2 \times 104 - 25\% = 117$), or a higher result than that based on the property-tax assessment.

The increase for the various periods can be calculated as follows (in 1 000 000 000 marks):

	Yearly increase	
	of property insured against fire	of the total national wealth
Yearly average for 1896—1902	5 119	7.7—25% = 5.8
„ „ „ 1902—1905	6 993	9 5—25% = 7.1
„ „ „ 1905—1908	8 457	8.2—25% = 8.2
„ „ „ 1908—1911	8 879	13.1—25% = 9.8

The tolerable agreement in the results from the two methods of calculation makes it admissible to assume an average annual increase of 6 to 7 000 000 000 marks in the national wealth of Germany, about one-half of which represents the visible increase of securities and bank deposits. During the most recent years the increase has averaged 10 000 000 000 marks; and here, too, about one-half would fall to the visible increase mentioned.

In the figures representing the yearly increase of the national wealth there is of course included also the automatic gain in value — not taken account of in reckoning national income — of existing property, especially land. This automatic increment of value was already calculated by Schmoller, from an estimate made by Becker, for the year 1886 at 2 500 000 000 marks; and Steinmann-Bucher estimated this increment at even 3 to 4 000 000 000 marks, — that is to say, 4 per cent. of the value of country and urban lands, assumed by him at 90 to 100 000 000 000 marks.

But even the earlier estimate of 2 500 000 000 marks appears to be too high. The increment of land values has evidently been much over-estimated, owing to the fact that the exceptional circumstances prevailing in the rapidly growing large cities were used as the starting-point. In small and medium-sized cities there has been an "unearned increment" of only a limited extent, and in the open country any increase of land values, where such has occurred, is to be attributed for the most part to improvements and more scientific cultivation An average rate of 1½ to 2 per cent. increase of land values, which were estimated above at 70 000 000 000 marks, would be more in harmony with the facts. This would give 1 000 000 000 to 1 500 000 000 marks, which could probably be further increased by 500 000 000 marks to cover the automatic increment of other forms of property. The yearly increase in the earned national wealth — apart from the unearned increment — would thus amount to 8 or 8 500 000 000 marks.

It is superfluous to remark that any attempt to express in numbers the development of the national wealth and the national income could make no claim to mathematical exactness, even if the bases for such a calculation were more trustworthy than they are. The values for wealth and income are reduced in these calculations to terms of money, the only common denominator at our disposal for expressing economic values. The value of money itself, however, is, as is well known, no absolutely unvarying quantity; and the question remains whether the value of money has not depreciated during the period covered by our inquiry, — an assumption for which especially the general advance of prices is brought forward as an argument.

If this be the case, a correction of the figures contained in the above calculation would have to be made, — but to what extent cannot be exactly determined. Such a correction, however, could only be of a slight nature, and it would not suffice to obliterate the main features of the development described.

The results of the foregoing inquiry may be summarised as follows:

The German national income amounts to 40 milliard marks a year, as compared with 22 to 25 000 000 000 marks about the year 1895.

Of these 40 000 000 000 marks about one-sixth, or 7 000 000 000 marks, is devoted to public purposes, and about 25 000 000 000 marks falls to private contumption. About 8 to 8 500 000 000 marks, which the automatic increase of existing property raises to 10 000 000 000 marks, is added annually to the national wealth, as compared with about 4 500 000 000 to 5 000 000 000 marks 15 years ago.

The national wealth of Germany amounts today to more than 300 000 000 000 marks, as compared with about 200 000 000 000 marks around the year 1895.

These massive figures express, in money values, the results of the prodigious economic labour which Germany has performed during the reign of our Emperor.

See next page.

NOTE.

Just before this translation went to press the population statistics for 1912 were published. The table on page 15 should now read as follows:

Yearly average for the decades	Absolute numbers			per 1000 inhabitants		
	Born	died	excess of births	born	died	excess of births
1901-1910	2061482	1195144	866338	33.9	19.7	14.3
1911	1927039	1187094	739945	29.5	18.2	11.3
1912	1925883	1085996	839887	29.1	16.4	12.7

The table of pig-iron production (in 1,000 tons) on page 63 should be corrected as follows:

Countries	1887	1911	Percentage of increase
United States	6520	24028	268.5
Germany	4024	15574	287.0
Great Britain and Ireland	7681	10033	30.6
France	1568	4411	181.3
Russia	612	3588	486.3
Belgium	756	2106	178.6

The table showing the consumption of coffee, cocoa-beans, tea and rice (on page 91) has been corrected according to later statistics, and should now read as follows:

	Coffee		Cocoa beans		Tea		Rice	
	Total tons	per caput kilo	Total tons	per caput kilo	Total tons	per caput kilo	Total tons	per caput kilo
1886-90	114263	2.38	4954	0.16	1912	0.04	84375	1.76
1912	168158	2.53	53601	0.81	4126	0.06	161072	2.43

The consumption of cotton in the year 1912 was 501660 tons, or 7,56 kilogrammes per caput (see page 91).

J. S. Preuss, Printer by Appointment of the Royal Court,
Berlin S. 14, Dresdenerstr. 43.

4871 YA 461
12-7-95 32180 MS